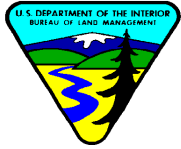




U.S. Department of the Interior

Bureau of Land Management
Rawlins and Rock Springs Field Offices

May 2000



Record of Decision

Environmental Impact Statement

Continental Divide/Wamsutter II Natural Gas Project, Sweetwater and Carbon Counties, Wyoming



RECORD OF DECISION

**ENVIRONMENTAL IMPACT STATEMENT
CONTINENTAL DIVIDE/WAMSUTTER II NATURAL GAS PROJECT
SWEETWATER AND CARBON COUNTIES, WYOMING**

**Rawlins and Rock Springs Field Offices
Bureau of Land Management
Rawlins and Rock Springs, Wyoming**

May 2000

May 24, 2000

Dear Reviewer:

This Record of Decision (ROD) for the proposed Continental Divide/Wamsutter II (CD/WII) Natural Gas Project located in Carbon and Sweetwater County, Wyoming, is provided for your information and use. The ROD defines the decision, explains the rationale (including key management considerations), and includes standards, mitigation, and monitoring requirements for the CD/WII Natural Gas Project. The Bureau of Land Management (BLM) decision is subject to appeal as explained in the decision.

On April 30, 1999, the BLM released the draft Environmental Impact Statement (EIS). On December 10, 1999, the final EIS for the CD/WII Natural Gas Project was released. The CD/WII EIS was prepared pursuant to the *National Environmental Policy Act* (NEPA) and other regulations and statutes to fully disclose the potential environmental impacts which could result from implementation of the CD/WII Natural Gas Project and to solicit public comments and concerns. The EIS process is designed to inform the public and to provide opportunity to comment on a proposed development and reasonable alternatives proposed for implementation on public lands. The analysis discloses through detailed analysis the potential impacts associated with implementing the proposal or alternatives and includes reasonable opportunities to mitigate potential impacts.

A copy of this ROD has been sent to affected government agencies and to those persons who either responded to public scoping, commented on the EIS, or otherwise indicated to BLM that they wished to receive a copy of the EIS/ROD. Copies of the ROD are available to the public at the following locations:

Bureau of Land Management
Wyoming State Office
5353 Yellowstone Road
Cheyenne, Wyoming 82009
Telephone (307) 775-6256

Bureau of Land Management
Rock Springs Field Office
280 Highway 191 North
Rock Springs, WY 82901
Telephone (307) 352-0256

Bureau of Land Management
Rawlins Field Office
1300 North Third Street
Rawlins, WY 82301
Telephone (307) 324-4200

The BLM would like to thank the individuals and organizations who provided suggestions and comments on the draft and final EIS. Your help has been invaluable in preparing the EIS and the attached ROD.

Sincerely,

/s/ Alan L. Kesterke

Al Pierson
State Director

Enclosure

ABBREVIATIONS AND ACRONYMS

APD	Application for Permit to Drill
BLM	Bureau of Land Management
C.F.R.	<i>Code of Federal Regulations</i>
CD/WII	Continental Divide/Wamsutter II
CD/WIIPA	Continental Divide/Wamsutter II Project Area
DEIS	Draft Environmental Impact Statement
EID	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FLPMA	<i>Federal Land Policy and Management Act</i>
GDRA	Great Divide Resource Area
GRRA	Green River Resource Area
IBLA	Interior Board of Land Appeals
LOP	Life-of-Project
NEPA	<i>National Environmental Policy Act</i>
RFD	Reasonable Foreseeable Development
RFO	Rawlins Field Office
RMP	Resource Management Plan
ROD	Record of Decision
ROW	Right-of-way
RSFO	Rock Springs Field Office
SN	Sundry Notice
SRA	Sensitive Resource Area
TPC	Transportation Planning Committee
USFWS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management
WGFD	Wyoming Game and Fish Department
WOGCC	Wyoming Oil and Gas Conservation Commission
WSA	Wilderness Study Area

**1.0 RECORD OF DECISION CONTINENTAL DIVIDE/WAMSUTTER II NATURAL GAS
PROJECT
SWEETWATER AND CARBON COUNTIES, WYOMING
ENVIRONMENTAL IMPACT STATEMENT**

This document records the decision made by the Bureau of Land Management (BLM) for managing the public land surface and federal mineral estate in the Continental Divide/Wamsutter II Natural Gas Project (hereafter referred to as the CD/WII project). The CD/WII project comprises approximately 1,061,200 acres of which 531,400 acres are federal surface; 9,800 acres are state surface; and 520,000 acres are private surface. The project area is located on lands administered by the BLM Rawlins Field Office (RFO) (formerly the Great Divide Resource Area [GDRA] Rawlins District), and the Rock Springs Field Office (RSFO) (formerly the Green River Resource Area [GRRA] Rock Springs District) (Map 1.1). The CD/WII project is also located within the checkerboard land pattern that resulted from early railroad grants made by the federal government to the Union Pacific Railroad Company. Most odd-numbered sections within 20 mi of each side of the railroad mainline are privately owned (surface and mineral rights) (Map 1.2). The State of Wyoming also owns the surface and mineral rights to approximately 16 sections in the area, and the mineral rights to about 75 more sections. Therefore, approximately 50% of the surface (531,400 acres) and 45% of the mineral estate (474,100 acres) within the CD/WII project area (CD/WIIPA) is managed by the BLM.

The CD/WII project is proposed by Amoco Production Company, Union Pacific Resources Company, Yates Petroleum Corporation, Snyder Oil Corporation, and other companies (hereafter referred to as the "Operators").

The BLM's preferred alternative for this project is the Proposed Action. The proposed action is generally in conformance with the BLM GDRA (RFO) Resource Management Plan (RMP), and is entirely in conformance with the GRRA (RSFO) Resource Area RMP, the Sweetwater and Carbon County land use plans, and the State of Wyoming land use plan. This selection is based on the analyses presented in this environmental impact statement (EIS) and on mitigation measures as described in the draft EIS (DEIS), final EIS (FEIS), and Record of Decision (ROD) that will further reduce environmental impacts. Mitigation measures include the following.

- 1) Reclamation Plan (Appendix A).
- 2) Transportation Plan (Appendix B) and associated Transportation Planning Technical Support Document.
- 3) Hazardous Materials Summary (Appendix C).
- 4) Wildlife Protection Plan (Appendix D) and associated cooperative agreements, the Biological Assessment (Appendix E) with additional terms and conditions for protection of black-footed ferret and mountain plover from the U.S. Fish and Wildlife (USFWS) Biological Opinion and associated implementation protocol developed in coordination between the USFWS and BLM (Appendix G), and information identified in Wyoming BLM Instruction Memorandum No. WY-2000-44 (Appendix I) clarifying BLM's responsibilities for *Endangered Species Act* compliance on non-federal lands.
- 5) Applicant-committed and BLM_ required mitigation/environmental protection measures (Appendix F).

The proposed action is to permit up to 3,000 wells at 3,000 well locations (1,500 on BLM-managed lands) in the CD/WIIPA. Approximately 1,500 mi of new roads; 1,500 mi of new pipeline; five compressor stations; one gas processing facility; 10 evaporation ponds; five disposal wells; and 50 water wells will also be included under the proposed action. Standard procedures as currently used in gas field developments throughout Wyoming and associated applicant-committed procedures will be employed during project development and operations. All project activities will comply with applicable federal, state, and county laws, regulations, and stipulations.

Development will occur on a year-long basis provided there is adequate advance planning and construction.

1.1 DECISION

The BLM decision is to approve the Operators' development plan as described in the Proposed Action of the CD/WII FEIS with the following modifications. Development will be reduced from the proposed 3,000 wells at 3,000 well locations to allow up to 2,130 wells at 2,130 well locations within the project area. Allowance of

the remaining 870 wells/well locations (not more than 435 wells or well locations on federal lands and/or federal mineral estate) will be considered pending completion of a planning review of the GDRA RMP for the RFO area.

This ROD will allow approximately 930 new wells/well locations within the jurisdictional boundary of the RSFO area (not more than 465 wells or well locations on federal lands and/or federal mineral estate), which accounts for approximately 31% of the original project development total and will allow 1,200 new wells/well locations within the jurisdictional boundary of the RFO area (not more than 600 wells or well locations on federal lands, and/or federal mineral estate) for a total of 2,130 well locations. This is assuming 50% of the wells will be drilled on federal lands and/or mineral estate. If private/state land development trends exceed 50% of the authorized wells, the number of wells permitted on federal estate will be limited accordingly, unless federal mineral drainage is identified. The total amount of new roads and new pipelines, and the number of ancillary facilities will be reduced to accommodate the number of wells drilled. Detailed rationale and justification for these modifications are noted in Chapter 3.0

Approval of the Proposed Action, as modified, provides for managing the CD/WIIPA in accordance with the *Federal Land Policy and Management Act of 1976* (FLPMA) (Sec. 202(e)), in a manner that allows for natural gas development while continuing to provide for the existing principal and major uses recognized by the land use plans (i.e., domestic livestock grazing, wildlife development and utilization, mineral exploration and production, and outdoor recreation) for this area. The Proposed Action, as modified, sustains the long-term availability of other resources, while promoting stability of local and regional economies, environmental integrity, and conservation of resources for future generations. This provides for complete conformance with BLM RMPs for the RSFO and the RFO areas.

The decision to approve the Proposed Action, as modified, recognizes the CD/WIIPA as an area which has been under development for natural gas since 1946, has significant reserves, and will continue to be developed for its natural gas resource. The decision recognizes that there are other important natural resources and values within the area which require consideration and protection from unnecessary or undue degradation. The decision incorporates restrictions and mitigative measures in consideration of federal, state, and local agencies, and public concerns raised during public meetings and in comments received on the draft and final EIS. Common concerns raised during public reviews addressed project compliance with the reasonable foreseeable development (RFD) projections in RMPs; potential cumulative impacts as they pertain to air quality, wildlife and wildlife habitat, threatened and endangered plant and animal species; changes in lands use, water resources, transportation planning, livestock grazing, recreation and visual resources; and social/economic impacts. This ROD provides consideration for the protection of the identified concerns through planning and protective measures applied with each authorization, operation, and abandonment activity as well as project-wide planning and protective measures.

Approval of the Proposed Action as modified and the individual project components associated with the Proposed Action, are subject to administrative requirements, added conditions of approval and mitigation measures, and the applicant-committed mitigation/environmental protection measures, all of which are listed in Appendix F. It also includes the applicant-committed practices, environmental standards, procedures, and requirements found in the EIS as the Reclamation Plan (Appendix A), the Transportation Plan (Appendix B), the Hazardous Materials Summary (Appendix C), the Wildlife Protection Plan (Appendix D), and the Biological Assessment (Appendix E). The terms and conditions for protection of black-footed ferret and mountain plover from the USFWS's recent Biological/Conference Opinion and associated implementation protocol developed in coordination between the USFWS and BLM (see Appendix G), including information shown in BLM Instruction Memorandum No. WY-2000-44 (Appendix I) are also part of the approved action. This ROD authorizes the BLM Rawlins and Rock Springs Field Managers to process Applications for Permit to Drill (APDs), Sundry Notices (SNs), and Rights-of-Way (ROWs) on public lands administered by the BLM for the CD/WII project Operators and for companies contracted by the Operators. Approval of individual applications authorizes the implementation of the various components of the CD/WII project (e.g., access road and well pad construction, pipeline and production facilities installation, drilling operations, etc.).

The Proposed Action, as modified, is not only BLM's preferred alternative, but is also BLM's environmentally preferred alternative. Rationale for this determination is described below.

1.2 APPROVED PROJECT COMPONENTS

This ROD provides the BLM Rawlins and Rock Springs Field Managers approval to permit the following project components on BLM-administered public lands, both surface and/or mineral estate (approximately 50% of the land ownership) within the CD/WIIPA (see Map 1.2).

- Up to 465 wells and/or well locations within the jurisdictional boundaries of the RSFO area on BLM-administered public lands (total number of wells on all lands [federal, private, and state] will not exceed 930).
- Up to 600 wells and/or well locations within the jurisdictional boundaries of the RFO area BLM-administered public lands (total number of wells on all lands [federal, private, and state] will not exceed 1,200 until the completion of a RMP review for the RFO area and until the remaining wells and development proposals analyzed in the CD/WII EIS are determined to be in compliance with any modifications made to the RMP).
- Approximately 550 mi of new or upgraded access road (average of 0.5 mi per well location) on BLM-administered public land with approximately 550 mi of new or upgraded access road on private/state lands
- Approximately 550 mi of new pipeline (average of 0.5 mi per well location) on BLM-administered public lands with approximately 550 mi of new pipeline on private/state lands.
- Three to four compressor stations (located on either federal or private/state lands).
- Three to four disposal wells (located on either federal or private lands).
- Seven evaporation ponds (these are likely to be constructed on private/state lands).
- Thirty-six water wells (located on either federal or private/state lands).
- One gas processing facility (located on either federal or private/state lands).

These numbers have been modified to reflect a Proposed Action of 2,130 wells (71% of the original proposal) for the entire CD/WIIPA. Development beyond the specified levels will require the re_evaluation of the EIS to comply with the possible amendments of the RMP for the RFO area. The remaining 870 wells of the original Proposed Action could be authorized if the action is in compliance with the amended RMP. However, the preparation of a new environmental analysis for additional development in this project area may be needed if there are significant changes to planning decisions which will be determined after the planning review of the RMP. In addition, some interim development (i.e., drilling on private/state lands, federal drainage wells, etc.) occurred during preparation of the EIS. These wells/developments will be included as part of the Proposed Action.

2.0 SUMMARY OF ALTERNATIVES CONSIDERED INCLUDING THE PROPOSED ACTION

The following describes the Proposed Action (full field development), two development alternatives with surface disturbance limitations (Alternative A--14.0-acre maximum surface disturbance per federally managed section in sensitive resource areas [SRAs] and Alternative B--30.0-acre maximum surface disturbance per federally managed section in SRAs), and the No Action Alternative which were analyzed in the EIS. The project entails the development of natural gas resources in the CD/WIIPA beginning in 1999, or subsequent to the release of the ROD, and continuing for approximately 20 years. Well location and bottom hole densities (as defined by the Wyoming Oil and Gas Conservation Commission [WOGCC]) will vary across the CD/WIIPA and will likely range from 640 acres/well to 80 acres/well (one to eight wells per section). As areas of the CD/WIIPA are developed and more is learned about the natural gas resources on the area, WOGCC-specified spacing orders for the area may change.

Alternatives involving project-wide well location densities, the drilling and development of varying numbers of wells, the exclusion of development on all public lands in the CD/WIIPA, and developments on and adjacent to the Adobe Town Wilderness Study Area (WSA) were considered but rejected for economic, environmental, and/or legal reasons.

2.1 PROPOSED ACTION

A maximum of 3,000 wells at 3,000 well locations would be developed in the CD/WIIPA (an estimated 1,500 wells or well locations on federal lands and/or federal mineral estate). Operators anticipate that fewer wells or well locations would be necessary, and in the event fewer locations are developed, decreased impacts are expected.

Drilling and development would begin in 1999 (or subsequent to the release of the ROD) within the CD/WIIPA and continue for approximately 20 years, with a life_of_project (LOP) of 30-50 years. Various associated facilities (e.g., roads, pipelines, power lines, water wells, disposal wells, evaporation ponds, compressor stations, gas processing facility) would also be constructed throughout the CD/WIIPA.

The Proposed Action would result in a maximum of: 7,800 acres of new surface disturbance from well locations (including on-site gathering, measurement, and dehydration facilities); 1,500 mi (10,000 acres) of new roads or upgrades of existing roads, 1,500 mi (4,500 acres) of new pipeline; and approximately 100 acres of new surface disturbance from ancillary facilities (i.e., five compressor stations [20 acres], one gas processing plant [30 acres], 10 water evaporation ponds [34 acres], five disposal wells [35 acres], and 50 water wells [25 acres]).

2.2 ALTERNATIVE A - 14-ACRE MAXIMUM SURFACE DISTURBANCE PER FEDERALLY MANAGED SECTION IN SENSITIVE RESOURCE AREAS

Surface disturbance throughout the entire CD/WIIPA resulting from Alternative A would be similar to the Proposed Action, except that LOP surface disturbance and associated impacts would likely be reduced on federal lands in SRAs. SRAs include areas with stabilized sand dunes, raptor nesting concentration areas, probable sage grouse nesting areas, crucial big game winter ranges, areas proximal to residential areas, Visual Resource Management (VRM) Class II areas, and areas with high densities of cultural resource sites.

Under Alternative A, a maximum of 14 acres of ground surface disturbance (exclusive of existing disturbance present on the area prior to the release of the ROD) would be allowed at any one time within SRAs on any given federally managed section (surface and/or mineral estate). Development on private and state surface and/or mineral estate would not be restricted under this alternative.

The 14-acre criteria would allow Operators to explore for natural gas throughout the entire CD/WIIPA, but would require notable changes in operational procedures for field developments within SRAs. Under this alternative, Operators would be able to explore their leases within SRAs (e.g., one well location per section) and to develop a limited number of additional locations (e.g., from one to three) depending upon the extent of new surface disturbance and associated reclamation status (see DEIS Table 2.2).

Surface disturbance limitation requirements would apply to all future oil and gas exploration and development activities conducted on federal lands in SRAs. To accommodate surface disturbance limitation requirements, Operators would have limited surface disturbance through:

- operational changes (e.g., multiple wells per pad using directional drilling; modified well location, road, pipeline, and/or ancillary facility design; use of surface pipelines; delaying construction/drilling operations until all unnecessary project_required federal surface disturbances are reclaimed);
- selection of alternative locations for ancillary facilities (e.g., outside SRAs or off federal surface); and/or
- reclamation of unnecessary existing surface disturbance on their lease (e.g., two_track roads).

The BLM, in consultation with other appropriate individuals, agencies, and land user groups (e.g., permittees, Wyoming Game and Fish Department (WGFD), USFWS), could modify surface disturbance limitation requirements if the Operators can show that alternative operational procedures would provide greater protection for sensitive resources than would limiting surface disturbance. To protect federal natural gas reserves within SRAs from drainage, these reserves could be developed regardless of reclamation status.

2.3 ALTERNATIVE B - 30_ACRE MAXIMUM SURFACE DISTURBANCE PER FEDERALLY MANAGED SECTION IN SRAS

Area_wide surface disturbance resulting from Alternative B would be similar to that for the Proposed Action and Alternative A, except that surface disturbance and associated impacts would likely be increased on federal lands in SRAs from that occurring under Alternative A and reduced from that occurring under the Proposed Action. Maximum surface disturbance within SRAs (exclusive of existing disturbance present on the area prior to the release of the ROD for this project) would be limited to 30 acres per federal section at any one time. The 30_acre maximum surface disturbance limitation was developed via the same means as that described for Alternative A and would allow Operators to develop natural gas resources at an intermediate level between Alternative A and the Proposed Action in SRAs. Under this alternative, Operators would be able to explore and conduct limited development of their leases within SRAs (e.g., from two to eight locations per section) depending upon the extent of new surface disturbance and associated reclamation status (see EIS Table 2.2). To protect federal natural gas reserves within SRAs from drainage, these reserves could be developed regardless of reclamation status.

2.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, the BLM would have denied the current proposal for natural gas development on federal lands in the CD/WIIPA as proposed by the Operators under the Proposed Action. However, denial of the current development proposal would not have been a denial of all natural gas development in the area. Under the No Action Alternative, it would be assumed that development of lands in the CD/WIIPA are likely to occur at levels similar to those which have occurred on the area in the past and would occur as authorized by existing management directives contained in RMPs. Site_specific *National Environmental Policy Act* (NEPA) analyses would have been conducted for all development activities on public lands or mineral estate; however, the planning measures identified for the Proposed Action and Alternatives A and B (e.g., Reclamation Plan, Transportation Plan, and Wildlife Protection Plan) would not be implemented.

For the purposes of this analysis, the No Action Alternative assumes that lands in the CD/WIIPA would be developed for natural gas production at approximately the same rate as has occurred previously (i.e., continuation of present management practices). The selection of the No Action Alternative in this EIS would not preclude natural gas development in the area.

Under the No Action Alternative, and for the purpose of this analysis, an estimated 845 well locations would be built, 422 mi of road would be constructed or upgraded, 422 mi of pipeline would be laid, and 100 acres of new surface disturbance would be required for ancillary facilities.

2.5 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

CD/WIIPA_wide well densities/spacing patterns were examined during initial project design; however, known characteristics of the gas reservoirs on and adjacent to the CD/WIIPA indicate that area_wide spacing patterns

are not practical and could result in unnecessary and undue surface disturbance and/or the potential drainage of federal reserves. Therefore, this alternative was rejected.

Alternatives involving fewer wells and associated facilities on all CD/WIIPA lands were also considered. These alternatives were rejected because the total extent of drilling and development necessary to recover existing natural gas resources on the CD/WIIPA is presently unknown. By limiting the number of wells in the area, these alternatives could inadvertently lead to drainage of the federal mineral estate and/or the necessity for future field_level NEPA analyses. Additionally, the BLM has limited authority over access to and development of private lands and non-federal minerals; therefore, alternatives guiding development on these lands were considered unreasonable (see DEIS Chapter 1.0 and below).

An alternative addressing increased surface disturbance at each well location (4.5 acres of new surface disturbance per location and 1.2 acres of LOP surface disturbance per location) was initially considered. However, increased Operator efficiencies regarding drill site and production facility layouts have resulted in substantially reduced surface area requirements for drilling and production operations (i.e., 2.6 acres of new surface disturbance per location and 0.8 acres of LOP disturbance per location). Therefore, this alternative was rejected.

A phased development alternative (e.g., limiting well numbers at any one point in time on specific areas) was considered for analysis, but was rejected since the Proposed Action as described involves the incremental development of fields within the CD/WIIPA. Additionally, BLM has limited control of private land development.

Various no development alternatives (i.e., the denial of APD and/or ROW applications on all CD/WIIPA lands) were also considered. These alternatives were rejected for the following reasons.

- More than half of the CD/WIIPA is not federally owned and is managed either by the State of Wyoming or private owners, and development of these areas would occur regardless of any decision to deny development on federal land.
- The BLM cannot deny access to private holdings across federal lands. The BLM's policy concerning access to oil and gas reserves on non-federal lands is contained in BLM Manual 2800.06D, release 2_224 (May 15, 1985), which directs the BLM to allow access to non-federally owned land surrounded by public land managed under FLPMA as necessary to secure to the owner the reasonable use and enjoyment thereof. Ingress and egress need not necessarily require the highest degree of access, but rather a degree of access commensurate with the reasonable use and enjoyment of the land. The access necessary for the reasonable use and enjoyment of the non-federal land cannot be denied, so long as the landowner complies with BLM rules and regulations on federal surface.
- The denial of all development on federal land could lead to the drainage of federal oil and gas reserves from wells on adjacent state and private surface. A drainage stipulation designed to protect the federal mineral estate is included in the lease_term contractual agreements for all leased lands in the CD/WIIPA, and since private land developments are anticipated, some well development on BLM lands would occur.
- The denial of the right to develop a valid lease could violate the lessees' contractual rights and result in the loss of federal royalties. An oil and gas lease grants the lessee the "right and privilege to drill from, mine, extract, remove, and dispose of all oil and gas deposits" in the leased lands, subject to the terms and conditions incorporated in the lease. The BLM cannot directly or indirectly prohibit, altogether, the development of the lease. To deny all activity would constitute a breach of contract of the Operator's rights to conduct development activities on the leased lands. Authority for complete denial can be granted only by Congress (see EIS Section 2.4).

Another alternative considered but rejected involved drainage drilling only. This alternative would have allowed drilling for federal minerals on federal leases only in areas being drained by offset non-federal wells and would have greatly limited the number of wells drilled on federal minerals. In order to estimate the number of wells that might be drilled under this alternative, the following assumptions were made.

1. There would be 1,200 wells drilled on non-federal minerals on a pattern of four wells per section, and 300 additional wells would be drilled as infill wells to produce a pattern of one well per 80 acres.
2. Wells drilled to increase well density from one well per 160 acres to one well per 80 acres would be drilled near the center of the sections, or within 200 ft of section lines.
3. The 90 gas wells (within or near the CD/WIIPA) analyzed by the Wyoming BLM Reservoir Management Group as part of drainage investigations are representative of all wells drilled to the Almond Formation in the project area. The analyses indicate that about 12% of the wells would have drainage radii larger than 0.25 mi. Wells drilled on non-federal minerals and with a drainage radius larger than 0.25 mi would cause drainage of federal oil and gas and would cause a federal protective well to be drilled.

Based on these assumptions, there would be about 144 drainage protection wells drilled. However, this alternative was rejected for the legal reasons listed in the previous bulleted paragraphs.

An alternative focusing on only federal land developments on the CD/WIIPA was also considered. The alternative was rejected because it would inadequately portray anticipated development on non_BLM lands in the CD/WIIPA. Development on private lands was considered under all alternatives analyzed (i.e., Proposed Action, Alternatives A and B, and No Action) to facilitate appropriate impact analyses.

The BLM also considered and rejected an alternative mandating the use of directional drilling, since all alternatives considered in this EIS may use directional drilling to access natural gas reserves beneath areas with sensitive surface resources. Further, due to the geology of the principle gas_bearing zone beneath the CD/WIIPA--the main Almond Sandstone Formation--directional drilling may be technically and/or economically infeasible.

One additional alternative involving the development of lands within the Adobe Town WSA was considered. This alternative was rejected because the BLM would not allow surface disturbance to occur in WSAs.

3.0 MANAGEMENT CONSIDERATIONS/RATIONALE FOR DECISIONS

The decision to choose and approve the Proposed Action, as modified, as the preferred alternative and as the environmentally preferred alternative of the CD/WII project included careful consideration of the following factors:

- 1) consistency with land use and resource management plans;
- 2) alternatives provide less protection;
- 3) public involvement, public scoping issues, and draft and final EIS comments;
- 4) agency statutory requirements;
- 5) national policy; and
- 6) measures to avoid or minimize environmental harm.

A discussion on each of these factors follows.

3.1 CONSISTENCY WITH LAND USE AND RESOURCE MANAGEMENT PLANS (RMP)

The original Proposed Action as outlined above is generally in conformance with the BLM GDRA (RFO) RMP, and is entirely in conformance with the GRRA (RSFO) RMP, the Sweetwater and Carbon County land use plans, and the State of Wyoming land use plan. However, the BLM must not authorize actions that are not completely in compliance with the RMPs.

The issue revolves around the reasonably foreseeable oil and gas development scenarios projected in RMPs and the planning decisions these projections may have influenced. Reasonably foreseeable development for oil and gas activity within the RSFO area as described in the GRRA RMP is projected to include approximately 1,300 new wells (9,985 acres of long_term disturbance for both private/state and federal lands) over a 20_year period (1990_2010). The level of development within the RSFO area required for the CD/WIII project as identified in this EIS (see DEIS Table 2.1) includes a maximum of approximately 930 new well locations and approximately 2,600 acres of new long_term disturbance (31% of the project development total). Therefore, the proposed project is within the reasonably foreseeable estimates for future oil and gas development within the RSFO area.

Reasonably foreseeable development for oil and gas activity within the RFO area (includes both federal and private/state lands) as described in the GDRA RMP is projected to include approximately 1,440 new wells (16,092 acres of long_term disturbance) over a 20_year period (1986-2006). The level of development within the RFO area required for the CD/WII project as identified in this EIS (see EIS Table 2.1) includes a maximum of approximately 2,070 new well locations (69% of the project development total). A check of well data in 1998 showed that 1,145 wells (including plugged and abandoned wells) have been drilled within the RFO area since 1985, which means 295 more wells could be drilled under the existing reasonably foreseeable development estimate for the RFO area. If well numbers were the sole criteria for formulating impact assessments and planning decisions, the reasonably foreseeable development estimate of the number of future oil and gas wells within the RFO area would easily be exceeded by this project.

It is important to note that RMP impact assessments and planning decisions within the RFO area were based on the estimated disturbance acreage, not the number of wells. Since 1985, efficiencies within the oil and gas industry have resulted in reductions in the disturbance acreage required for oil and gas exploration and production. The RMP estimate of future long_term oil and gas disturbance within the RFO area was projected to be approximately 16,092 acres for 1,440 wells (approximately 11.2 acres/well); however, estimates based on the existing long-term oil and gas disturbance within the CD/WIIPA (7,600 acres for 845 wells; see DEIS Table 2.1), reveal that approximately 9.0 acres of long-term disturbance is present for each of the 845 wells. This 9.0 acres is a conservative estimate (overestimation) of long_term disturbance.

Using 9.0 acres of long_term disturbance per well, it is estimated that approximately 10,305 acres of long_term disturbance has resulted from the 1,145 wells developed within the RFO area since 1986. An additional 1,200 acres of long-term oil-and-gas-related disturbance (approximately 298 well locations) has been authorized or proposed within the RFO area for the Creston/Blue Gap, Mulligan Draw, Hay Reservoir, Sierra Madre, Dripping Rock, and South Baggs (proposed) projects. Therefore, approximately 4,587 acres (16,092 acres projected in the RMP less 10,305 acres estimated existing long_term disturbance and 1,200 acres authorized for proposed future disturbance) remain for long_term oil and gas development disturbance in the RFO area.

The CD/WII project is estimated to require approximately 5,727 acres of long-term disturbance in the RFO area (2,070 well locations at 2.77 acres per well). Therefore, long-term disturbance acreage estimates for the CD/WII project exceed the GDRA RMP/EIS reasonably foreseeable development estimates for future oil and gas development in the RFO area.

The GDRA RMP projected a planning period of 20 years, and data used in RMP analyses for oil and gas development was compiled through 1985. Monitoring and tracking of well development since the completion of the RMP will continue. BLM initiation of a RFO area RMP review and possible amendment will need to occur prior to reaching the reasonably foreseeable disturbance estimates made in the current RMP. This could take between 3 and 5 years to complete and the BLM will not authorize oil-and-gas-development actions (APDs, ROWs) that exceed current reasonably foreseeable disturbance estimates prior to the plan review and possible amendment. Based on the long-term disturbance acreage required per well for the CD/WII project (2.77 acres) approximately 1,655 wells could be authorized in the RFO area under the existing reasonably foreseeable disturbance acreage estimate (i.e., 1,655 wells = 4,584 acres of available long-term disturbance divided by 2.77 acres per well). However, this could preclude or delay future proposed oil and gas developments within the RFO area if all these wells be dedicated to the CD/WIIPA before a RMP review and possible amendments are completed.

It is anticipated that field developments within the CD/WIIPA will require 10-20 years, with approximately 150 to 300 wells being drilled per year. The average for the last 2 years has been about 150 wells. However, with favorable changes in natural gas prices and with upward trends in demand, yearly increases in drilling could easily exceed 150 wells per year and be as high as 300 wells per year.

The 20-year planning period for the RFO area RMP extends until approximately year 2005. Assuming well development occurs within the first 10 years, and over 250 wells are drilled each year, the CD/WII project could be 50% developed by this date. This could result in approximately 1,000-1,200 wells being drilled in the project area (i.e., 1,200 well locations = 3,324 additional acres of long-term disturbance) within the jurisdictional boundaries of the RFO area. This allows approximately 455 wells (1,260 acres of long-term disturbance at 2.77 acres per well) for future for oil and gas development proposals outside the CD/WIIPA.

All proposed land and resource use and management actions must conform with RMP decisions. In the absence of conformance, actions must either be denied or modified so they do conform or the RMP decisions must be changed. Therefore, the Proposed Action for this project is modified to authorize no more than 1,200 wells (i.e., 870 fewer wells than proposed) within the RFO area. This will allow a plan review and possible changes to RMP decisions to be made through established procedures which involve public notice, public input, and formal decision-making. This process is anticipated to take from 3 to 5 years to complete.

In summary, limiting the number of proposed wells (including roads, pipelines, etc.) to 930 wells/well locations within the CD/WIIPA within the jurisdictional boundary of the RSFO area and to 1,200 wells/well locations within the CD/WIIPA within the jurisdictional boundary of the RFO area will allow:

- a) a reasonable amount of drilling and development activity within the CD/WIIPA for at least 5 years;
- b) an opportunity for other future oil and gas developments to occur outside of the project area;
- c) an adequate amount of time for the BLM to conduct a review of the existing RMP for the RFO area; and
- d) the Proposed Action to be in complete conformance with RMPs for both the RSFO and RFO areas.

3.2 ALTERNATIVES PROVIDE LESS PROTECTION

Throughout the development of the EIS, it was believed that the formulation of the alternatives would add further protection to sensitive resources and was necessary considering the size and scope of this project. It was believed that Alternatives A and B would provide that increased protection. However, through the analysis it became apparent that by choosing Alternatives A or B, operators may elect to concentrate initial exploration and development on non-BLM lands or on BLM lands outside SRAs to avoid increased protection and mitigation requirements (i.e., increased development costs). This could effectively negate the whole purpose of protecting certain resources (i.e., fragmentation and major disturbance of wildlife habitats). Therefore, increase in the extent of surface disturbance on private or state lands within SRAs and on federally managed lands outside of SRAs could be avoided if the proposed action is chosen.

In addition, Alternatives A and B seem better adapted to managing sensitive resource values on projects in areas with solid block federal ownership. Alternatives A and B would not be as effective in the checkerboard land pattern found in the CD/WIIPA. The opportunity for proponents to relocate activity from federal surface on to private surface under Alternatives A or B could occur. Past experience during the development of this EIS has shown that proponents were not willing to wait for the completion of the EIS, and instead, moved to private land where access was available. Proponents would be more likely to reroute activity to private land than to operate under the more restrictive construction practices required on public land by Alternatives A or B. Overall, BLM will be able to better manage placement of facilities on federal lands and better influence placement on private lands if operators are not so restricted to development time-frames in SRAs on federal lands. The reclamation requirements under Alternatives A and B would delay new activity on federal land and it is likely that the operators would further develop private land adjacent to the federal land. BLM would therefore lose the opportunity to influence how the action occurred.

Finally, the analysis in the EIS showed that long-term surface disturbance would be similar under the Proposed Action and Alternative B and potentially could be the same for all alternatives if wells drilled on private land resulted in drainage of the federal land or if other surface developments were forced onto private lands due to restriction on the adjacent federal land. The DEIS indicates the potential for 144 drainage wells on federal land under the No Action Alternative. It is likely that similar drainage well numbers would occur under Alternatives A and B. Wells drilled on private land adjacent to federal land SRAs could create a situation where Alternative A or Alternative B surface-disturbance limitations would be waived in order to address a drainage situation in a timely manner.

In review of these findings, it appears that choosing the Proposed Action, as modified, will provide the BLM more discretion and opportunity to manage development on public lands and therefore, help lessen development impacts on the private lands.

3.3 PUBLIC INVOLVEMENT, PUBLIC SCOPING ISSUES, AND EIS COMMENTS

Opportunity for public involvement was provided throughout the environmental process. A public scoping (public involvement effort) to determine issues and concerns to be addressed in this EIS was commenced on March 6, 1995. Due to a change in the extent of the project, public scoping was reinitiated on May 30, 1997. Scoping notices were mailed to 1,040 individuals, agencies, and groups (including government offices, elected officials, public land users and groups, lessees and operators, private landowners, newspapers, and radio and TV stations). The notices described the project and requested comments. Additionally, two public scoping meetings were held to provide further opportunity for public comment. Forty-seven comment letters and 15 telephone calls were received, and 18 comments were provided during the public meetings. A summary of the scoping issues is found on pages 1-13 and 1-17 through 1-21 of the DEIS.

The DEIS was made available for public review on April 30, 1999, and public meetings were held on May 24 and 25, 1999. Over 600 copies of the DEIS were distributed to the public for review and comment. Approximately 12 individuals commented at public meetings and 94 letters were received in the mail. Of those commenting during public meetings for the DEIS, all expressed strong support for the CD/WII project as proposed. Some comment letters presented concerns and new data for the air quality analysis, expressed concerns about impacts to wildlife and threatened and endangered species, requested emphasis on monitoring mitigation measures, and requested compliance with the RMP reasonable foreseeable development scenarios. The majority of the comment letters were in favor of the project as proposed.

In regards to issues of threatened and endangered plant and animal species, the BLM initiated formal consultation and conference with the USFWS to evaluate protective measures for black-footed ferret (listed species) and mountain plover (proposed listed species). The outcome, findings, and clarifications as rendered in the USFWS's opinion are found in Appendix G. Reasonable and prudent measures, the terms and conditions as outlined in the opinion, and associated implementation protocol developed in coordination between the BLM and USFWS including procedures identified in BLM Instruction Memorandum No. WY-2000-44 (Appendix I) are part of the Proposed Action as modified.

The FEIS was issued December 10, 1999, for a 30-day comment period. Over 700 copies of the FEIS were distributed to the public for review and comment. In addition, media releases were sent to newspapers in Wyoming announcing the availability of the FEIS for public review. Only four comment letters were received (Appendix H). Three of the letters expressed some concerns about adding additional mitigation and

amending/revising the RMP for the RFO area; however, all four comment letters were generally in support of the analysis and/or proposed development.

In addition to public scoping and EIS document reviews, a Transportation Planning Committee (TPC) comprised of county, state, federal, industry, and private groups and/or individuals was organized in 1998. This was a direct result of the Proposed Action mitigation for Transportation Planning as discussed in Appendix B. A memorandum of understanding was developed and signed to further define the goals and objectives of this planning group. The group has been meeting twice yearly to address current needs and issues in the project area.

Action has also been taken to develop a formal cooperative agreement between industry and state and federal agencies to better address monitoring and protection of wildlife within the project area. Final agreement and signature on the document is still pending. This initiative was a direct result of Proposed Action mitigation as outlined in the Wildlife Protection Plan (Appendix D).

3.4 AGENCY STATUTORY REQUIREMENTS

The BLM decision is consistent with all federal, state, and county authorizing actions (EIS, Table 1.1) required to implement the CD/WII Operator's proposed action. All pertinent statutory requirements applicable to this proposal were considered. These include consultation with the USFWS regarding threatened, endangered, and candidate species; coordination with the State of Wyoming regarding wildlife, environmental quality, and oil and gas conservation; and coordination with Carbon and Sweetwater County Commissioners for obtaining construction and use permits.

3.5 NATIONAL POLICY

Private exploration and development of federal oil and gas leases is an integral part of the BLM oil-and-gas-leasing program, under authority of the *Mineral Leasing Act of 1920* and FLPMA. The United States continues to rely heavily on foreign energy sources. Authorization for the lessees to exercise their rights in developing oil and gas leases is necessary to encourage development of domestic oil and gas reserves to reduce the United States' dependence on foreign energy supplies. Also, natural gas is this nation's "energy-of-choice" because it is clean burning and less polluting. Therefore, the decision is consistent with national policy.

3.6 MEASURES TO AVOID OR MINIMIZE ENVIRONMENTAL HARM

The adoption of the Proposed Action, as modified in this decision, includes all practical means to avoid or minimize environmental harm. The decision, to ensure the environmental consequences of the field development activities will be minimal, includes not only the required environmental safeguards and resource protection measures prescribed by the GRRRA (RSFO) and the GDRA (RFO) RMPs, it also includes the additional mitigation or protective measures identified in the CD/WII draft and final EIS and this ROD. The decision has given full consideration to all public, local, state, and other federal agency input. No substantial issues remain unresolved as raised by either governmental agencies, industry, groups, or individuals.

4.0 COMPLIANCE AND MONITORING

Because of the importance of mitigation for avoiding or minimizing adverse impacts, an intensive monitoring program will be implemented by the Operators and BLM with input from state and other federal agencies. Mitigation and guidelines for monitoring are incorporated in the Proposed Action as the applicant-committed measures (Appendix F), Reclamation Plan (Appendix A), Transportation Plan (Appendix B), Hazardous Materials Summary (Appendix C), and Wildlife Protection Plan (Appendix D) and Biological Assessment (Appendix E) with the terms and conditions of the USFWS Biological Opinion and associated implementation protocol developed in coordination between the BLM and USFWS (Appendix G) and including BLM Instruction Memorandum No. WY_2000-44 (Appendix I).

Monitoring of construction, drilling, and production operations will be routinely inspected by BLM personnel. In addition, each Operator may be required to have an individual to serve as Environmental Compliance Coordinator. The Environmental Compliance Coordinator will be responsible for assuring that mitigation measures are applied and monitoring activities are conducted as necessary to assure surface impacts are minimized. Operators and the BLM will provide qualified representatives on-site during construction to validate construction commensurate with the approved design.

The procedures identified for monitoring, evaluation, review, and potential modification (e.g., changed mitigative actions) identified in the EIS Reclamation Plan, Transportation Plan, and Wildlife Protection Plan (EIS Appendices A, B, and D respectively) provide for an "adaptive environmental management plan" for most, if not all, resources with the potential for significant impacts. Although an intensive analysis was completed for potential impacts to air quality, an adaptive environmental management plan is not necessary for air quality. This is due to finding no project-specific significant air quality impacts and to the fact that BLM cannot implement specific air quality mitigations since it has no authority to do so.

The following provides a brief summary of how the transportation, reclamation, and wildlife protection plans provide for compliance, monitoring, and/or adaptive environmental management.

The Reclamation Plan (Appendix A) involves components designed to protect or otherwise minimize impacts to many area resources including surface waters and groundwaters, vegetation communities, wildlife, livestock grazing, recreation, and visual resources. The process to assure appropriate reclamation is provided in Appendix A, Figure A-1.1. Reclamation monitoring will be the responsibility of both the BLM and the Operators. Monitoring will be accomplished through joint, coordinated monitoring efforts. Details on BLM/Operator monitoring responsibilities will be provided in site-specific plans. Monitoring protocol and success criteria are outlined in detail in the Sections A-6.2 and A_6.3 of Appendix A. Monitoring data will be compiled by the BLM to provide future guidance for successful reclamation.

The transportation planning process as identified in Appendix B and the associated technical support document, involves components designed to protect virtually all area resources. A TPC that includes BLM, Operators, state and county transportation departments, WGFD, landowners, grazing permittees, and other interested parties has been established. Road development and closure planning in the CD/WIIPA will include multiple-entity involvement on an annual basis. Where potential problems can be identified prior to road development, road development plans may be changed. Furthermore, where problems are identified after roads have been constructed, the TPC will work to alleviate these situations. Yearly TPC meetings are opened to the public as a method to assist in resolution of issues.

The Wildlife Protection Plan (Appendix D) is designed to determine the extent of adverse effects occurring to sensitive wildlife resources, and in the event adverse effects are found, the plan calls for increased protection measures. Currently proposed techniques and associated responsibilities are shown in Appendix D, Tables D-2.1, D-2.2, and D-2.3. An annual review of wildlife monitoring, techniques, and collected data will be conducted by BLM, Operators, WGFD, and USFWS. Annual reviews will help determine if protection measures have been adequate or if additional protective measures are required. To further specify responsibilities and commit financial obligations, a cooperative agreement among participating agencies and operators will be required.

5.0 APPEAL

This decision may be appealed to the Interior Board of Land Appeals (IBLA), Office of the Secretary, in accordance with the regulations contained in 43 *Code of Federal Regulations* (C.F.R.) 3165.4(c). If an appeal is filed, the notice of appeal must be filed in this office (Bureau of Land Management, State Director, P.O. Box 1829, Cheyenne, Wyoming 82003) within 30 days of the date the notice of the decision appears in the *Federal Register*. The appellant has the burden of showing that the decision appealed from is in error.

If you wish to file a petition (pursuant to 43 C.F.R. 3165.4(c)) for a stay (suspension) of the effectiveness of this decision during the time that your appeal is being reviewed by the IBLA, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed in 43 C.F.R. 3165.4(c). Copies of the notice of appeal and petition for a stay must also be submitted to the IBLA and to the appropriate office of the Solicitor at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

6.0 SIGNATURE

/s/Alan R. Kesterke
Wyoming State Director

May 24, 2000
Date

APPENDIX A:
RECLAMATION PLAN

**RECLAMATION PLAN
FOR THE CONTINENTAL DIVIDE/WAMSUTTER II
NATURAL GAS PROJECT**

Prepared for

**U.S. Bureau of Land Management
Rawlins Field Office
Rawlins, Wyoming**

and

**Rock Springs Field Office
Rock Springs, Wyoming**

By

**TRC Mariah Associates Inc.
Laramie, Wyoming
MAI Project 1295**

April 1999

ABBREVIATIONS AND ACRONYMS

APD	Application for Permit to Drill
BLM	Bureau of Land Management
CD/WIIPA	Continental Divide/WamsutterII Project Area
COE	U.S. Army Corps of Engineers
EIS	Environmental impact statement
ERRP	Erosion Control, Restoration, and Revegetation Plan
IDT	Interdisciplinary Team
LOP	Life-of-project
PLS/ac	Pounds of pure live seed per acre
ROW	Right-of-way
VRM	Visual Resource Management
WDEQ	Wyoming Department of Environmental Quality
WOGCC	Wyoming Oil and Gas Conservation Commission

A_1.0 RECLAMATION OBJECTIVES

This reclamation plan will be used by the Operators of the Continental Divide/WamsutterII Natural Gas Project as guidance to achieve successful reclamation on federal lands within the Continental Divide/WamsutterII Project Area (CD/WIIPA). Alternate reclamation procedures may be implemented on private and state lands. The plan complies with Bureau of Land Management (BLM) reclamation policy (BLM 1990a) and management directives specified in the Great Divide and Green River Resource Area Management Plans (BLM 1987, 1988, 1990b, 1992, 1996). The reclamation plan was developed based on these policies and directives, Executive Order 11987, and impacts and scoping issues identified in this environmental impact statement (EIS). The procedures presented in this plan are designed to allow flexibility based on specific conditions encountered at each proposed disturbance site. Site-specific reclamation procedures will be developed in each Application for Permit to Drill (APD), right-of-way (ROW) application, or Sundry Notice and submitted to the BLM for review and approval prior to the authorization of surface-disturbing activities.

Short-term reclamation goals will be the immediate stabilization of disturbed areas and the protection of adjacent undisturbed areas from unnecessary degradation. The long-term reclamation objective will be to restore all disturbed lands to conditions equal to or better than predisturbance conditions by developing/re-establishing self-sustaining native vegetation communities that meet or exceed predisturbance parameters for cover, species composition, production, and diversity (i.e., ecosystem reconstruction). Other goals include the protection of surface and ground water resources through the restoration of a geologically and hydrologically stable landform that will support future land uses (i.e., wildlife habitat, recreation, livestock grazing, and mineral exploration) and the prevention of the spread of noxious weeds.

BLM-required reclamation objectives are:

- the isolation and/or removal of all undesirable materials (e.g., poor quality subsoils, contaminated soils, potentially hazardous materials) to protect the rehabilitated landscape from contamination;
- the assurance of subsurface (downhole) integrity to minimize subsidence and/or eliminate ground water co-mingling and contamination (downhole reclamation and abandonment procedures are specified in Section 2.6.12 of the EIS and will be approved by the BLM through a Sundry Notice prior to implementation);
- the recontouring and implementation of other soil conservation, surface manipulation, and water management techniques to establish stable slopes, water courses, and drainage features to minimize erosion and sedimentation;
- the revegetation of reclaimed areas to stabilize soils and establish a self-perpetuating native plant community capable of supporting post-disturbance land uses;
- the establishment of acceptable long-term visual aesthetics by mitigating visual contrasts; and
- the monitoring and management of reclamation sites by Operators to evaluate and encourage continued reclamation success (BLM 1990a).

Site-specific reclamation objectives will be stipulated in Surface Use Plans and/or Erosion Control, Restoration, and Revegetation Plans (ERRPs) (see Section A_6.0).

The reclamation process has been divided into four major phases: predisturbance planning and site preparation, temporary reclamation, permanent reclamation, and reclamation success monitoring. By minimizing the amount of land disturbed through predisturbance planning and initially preparing the site for construction activities with the understanding that the area will eventually be reclaimed (e.g., top soil stripping and stockpiling for later use during site rehabilitation, keeping facilities away from cut-and-fill slopes and in as small an area as possible), the acreage requiring disturbance will be reduced and reclamation success will be facilitated. Temporary reclamation will involve the restoration of areas that may be utilized for the planned development but will not necessarily need to be disturbed for the entire life-of-project (LOP) and will include the stabilization of disturbed areas to control runoff and erosion until permanent reclamation procedures are applied. Construction-related disturbance areas along road ROWs are examples of temporary reclamation sites.

Permanent reclamation will include the rehabilitation of locations no longer needed for the project. A nonproducing well location and associated access road are examples of permanent reclamation sites. Upon project completion, all disturbed areas except roads slated to be retained for other land uses will be permanently reclaimed as designated by the BLM or other landowner. Reclamation success monitoring will involve assessing the status of reclaimed areas to ensure that these areas meet desired site stability and productivity standards. Figure A_1.1 illustrates the proposed reclamation process for the CD/WIIPA.

A_2.0 AFFECTED COMMUNITIES

As described in Section 3.2.1 of this EIS, the CD/WIIPA contains eight dominant vegetation types including Wyoming big sagebrush (731,900 acres, 69.0%); greasewood fans and flats (151,100 acres, 14.2%), desert shrub (97,100 acres, 9.2%), saltbush fans and flats (40,600 acres, 3.8%), basin exposed rock/soil (31,000 acres, 2.9%), shrub-dominated riparian (4,500 acres, 0.4%), unvegetated playa (3,400 acres, 0.3%), and mixed grass prairie (1,600 acres, 0.2%) (see EIS Map 3.7).

Approximately 9,200 acres (<1%) of the CD/WIIPA is considered wetland. Wetland areas occur as inclusions within the dominant vegetation types and consist primarily of ponds and reservoirs/impoundments located along ephemeral stream channels. The greatest concentration of wetlands occurs in the northeastern portion of the CD/WIIPA in the Chain Lakes area (see EIS Section 3.2.1.1 and Map 3.6). Stabilized sand dunes and other sandy soil areas also occur throughout the CD/WIIPA and occupy approximately 90,000 acres (8.5%) of the area (see EIS Section 3.1.4.2 and Map 3.4). No active dunes are known to occur.

Reclamation potential within the sagebrush, greasewood, shrub-dominated riparian, and mixed grass communities will be good to excellent; however, in the more barren areas, including the desert shrub, exposed rock/soil, saltbush, and playa communities, reclamation will be limited by shallow soils, droughtiness, salinity, and other adverse conditions. In addition, the sandy soils associated with stabilized dunes are very susceptible to wind erosion when vegetation cover is removed, and the restoration of these areas following disturbance may pose the greatest reclamation challenge on the CD/WIIPA. Reclamation potential may also be limited by other extant conditions on the CD/WIIPA, including: salinity, alkalinity, steep slopes, noncohesive soils, weather conditions (high winds, drought), periodic flooding, short growing seasons, and livestock and wildlife use.

A_3.0 PREDISTURBANCE PLANNING AND SITE PREPARATION

During selection of drill site, road, pipeline, and ancillary facility locations, consideration of future reclamation needs will facilitate land rehabilitation by minimizing the amount of land disturbed and avoiding, where possible, areas where reclamation potential is low. Avoidance areas stipulated in the EIS include:

- areas with high erosion potential (e.g., rugged topography, steep slopes [$>25\%$], stabilized sand dunes, floodplains),
- areas with saturated soils,
- wetland/riparian areas (e.g., perennial stream channels and open water areas) and a 500-ft buffer,
- ephemeral and intermittent channels and a 100-ft buffer, and
- Visual Resource Management (VRM) Class II areas and areas visible from and within 0.25 mi of contributing segments of the Overland and/or Cherokee Trails.

Approximate disturbance for well locations will be 2.6 acres/location initially and 0.8 acres/location for the life of the well. Approximately 1.8 acres/location will be reclaimed temporarily at each producing well location; permanent reclamation may be implemented in some or all of an area if it is determined that additional disturbance will not be necessary during the LOP. For the purpose of the EIS it is estimated that approximately 4.8 acres/mi of short-term tandem road and pipeline disturbance will be required for the project; long-term disturbance from tandem road and pipeline corridors is estimated at approximately 1.9 acres/mi. In addition, a maximum of approximately 144 acres of disturbance will be required for ancillary facility sites (i.e., water wells [50 wells at 0.5 acres/well], water disposal wells [5 wells at 7.0 acres/well], evaporation ponds [10 ponds at 3.4 acres/pond], compression facilities [5 facilities at 4.0 acres/facility], and a gas processing plant [30 acres]) (see EIS Section 2.6.8). Estimated maximum disturbance levels for the entire project are shown in Table 2.1 of the EIS, and disturbance limitations under the various project alternatives are given in Table 2.2.

Prior to disturbance, Operators and the BLM will conduct on-site inspections of each proposed disturbance site to determine the suitability of proposed facility locations and/or alignments and to develop a site-specific reclamation plan. In addition, Operators will submit for BLM approval Surface Use Plans, Plans of Development, and/or ERRPs for each proposed surface disturbance site. These plans will contain site-specific erosion control, revegetation, restoration, and monitoring procedures and will provide detail on the following:

- project administration, time frames, and responsible parties;
- reclamation objectives;
- predisturbance landscape characteristics, including species composition and plant cover;
- topsoil removal, storage, and handling criteria;
- runoff, erosion, and sedimentation control procedures;
- seedbed preparation, seed mixes and rates, and seed application procedures;
- fertilization, mulching, and/or other site protection (i.e., small-scale fencing and weed, livestock, and herbivore control) requirements; and
- reclamation monitoring and maintenance.

Stormwater pollution prevention plans will be prepared for all project activities requiring greater than 5 acres of disturbance to ensure that precipitation will not cause erosion or sedimentation problems. These plans may be prepared for groups of wells, where multiple well, road, pipeline, and/or ancillary facility locations have been determined. A Notice of Intent will be submitted to the Wyoming Department of Environmental Quality (WDEQ) for review, and a pollution prevention plan prepared and implemented. Copies of the pollution prevention plan and inspection reports will be retained on file in the Operators' offices.

A_3.1 TOPSOIL AND SUBSOIL HANDLING

Topsoil will be salvaged and stockpiled from all proposed disturbance areas unless the BLM deems that leaving topsoil in place (e.g., during pipeline construction) will better facilitate successful reclamation. Prior to BLM authorization of surface disturbance, the amount of topsoil or other suitable plant growth material to be removed and topsoil storage areas will be specified. If less than 6 inches of topsoil are available, topsoils

may be mixed with suitable subsoil materials for stockpiling so that a minimum of 6 inches of plant growth material is available for use during reclamation. The need to strip topsoil for some project activities (e.g., along pipeline routes) will be determined on a site-specific basis. Topsoil in excess of 6 inches, if available, may be stored for use in areas off-site that lack sufficient topsoil for reclamation. Whenever possible, topsoil will be used immediately. Topsoil stockpiled for more than 3 months will be protected from erosion by reducing piles to less than 3 ft in height and by seeding and possibly mulching.

Topsoil stockpile areas will be marked in the field and noted on maps. Topsoil stockpile surface area will be maximized to reduce adverse impacts to soil microorganisms. All surface vegetation stripped with topsoils will be incorporated directly into the topsoil to augment organic matter content and seed source availability, unless shrub materials are required to be handled separately. Runoff will be diverted around topsoil stockpiles to minimize erosional loss. Topsoil stockpiles will be located as close as possible to future reclamation sites.

In most instances, disturbance sites will be designed with a balance of cut and fill, thereby minimizing the volume of subsoil stockpiling required. However, in those areas where subsoil materials will be stockpiled, they will be isolated from topsoil stockpiles and located so as not to affect existing drainages. These stockpiles will be kept as small as possible and will be constructed such that they remain stable until they are used during reclamation. In addition, they will be located such that minimal construction activity is required during recontouring.

The collection and analysis of soil samples from disturbed areas may be required as part of reclamation planning to determine appropriate reclamation seed mixtures and the need for soil amendments. However, in most instances, the vegetation present at and surrounding proposed disturbance sites will provide sufficient information for determining reclamation seed mixes. Soil testing and reports will be the responsibility of the Operators. Testing (as deemed necessary by the BLM) may include, but is not necessarily limited to pH; texture; salinity; alkalinity; nitrogen, phosphorus, and potassium levels; organic matter; and toxic elements (e.g., selenium).

Alternate site preparation procedures may be applied in some areas (i.e., dry alkaline sites, badlands, floodplains, wetland/riparian areas) to facilitate reclamation. In dry alkaline areas (which generally occur at relatively flat sites associated with playas or broad drainages), there is often very little topsoil, and excavations may result in drainage problems. In these areas, vegetation and topsoil removal usually results in the need to import materials from off-site to build up required surfaces. Borrow material sources and quantities will be defined prior to construction. Badland areas also have limited suitable topsoil, with topsoil found only at isolated sandy areas. Augmented volumes of suitable soil materials will be removed from sandy areas and stockpiled with vegetation for later use during reclamation of badland sites. In addition, topsoils in floodplain areas may not be removed, depending on the potential for shallow ground water occurrence.

In wetland/riparian areas, vegetation will be cut to ground level, leaving existing root systems intact. Cut vegetation will be removed from these areas for disposal. Grading activities will be limited to areas directly over pipeline trenches and road surface areas where these corridors cross wetlands. At least 12 inches of topsoil will be salvaged and replaced except in areas with standing water or saturated soils. Use of construction equipment in these areas will be limited, and if standing water or saturated soils are present, wide-track or balloon-tire construction equipment may be used or normal construction equipment will be operated on equipment pads or geotextile fabric overlain with gravel fill. Equipment pads will be removed immediately following completion of construction activities. Trench spoil will be placed at least 10ft away from drainage channel banks, and dirt, rockfill, and brush riprap will not be used to stabilize ROWs.

A_3.2 WELLPAD AND FACILITY SITE CONSTRUCTION

Prior to construction, proposed pad and facility site locations will be surveyed and staked. Additionally, all erosion control design considerations will be reviewed by the BLM to determine their adequacy. Locations will be designed to parallel the contour with reserve pits on the uphill side of pads whenever possible. Reserve pits will be imperviously lined, as necessary, and pits will not be constructed in floodplain areas or at other

locations proximal to open water. Wellpads will be designed and constructed to disturb the smallest area necessary to provide for efficient and safe operations.

All cut-and-fill slopes with greater than 3 ft cut and/or fill will be staked at least every 50 ft. Spoil storage areas will also be staked. All cut-and-fill work will be designed to minimize the amount of material required during construction, and if excess material is generated, it will be incorporated into fill slopes or placed in designated areas and stabilized. Backsloping will be necessary only in areas of steep terrain (>10% slopes).

During construction, interceptor ditches will be installed above cuts and around reserve pits, where necessary. Collector ditches and sediment control structures, designed for a 10_year/24-hr storm event, may be required below fill areas. Flows of less than the 10_year/24_hr event will be diverted and/or collected before being discharged from the disturbed area. Qualified specialists will supervise the installation of all erosion control structures, including berms, dikes, and trenches, as deemed necessary by the BLM.

No surface disturbance will be allowed on slopes of greater than 25% unless proposed erosion control and rehabilitation/revegetation procedures are deemed adequate by the BLM. In addition, most construction sites in floodplains will be located on imported fill compacted on the existing ground surface or geotextile membrane. The entire wellpad may be bermed in these areas. Detailed engineering proposals, revegetation and restoration plans, and a site-specific environmental analysis by the BLM will be required.

A_3.3 ROAD AND PIPELINE LOCATION AND ALIGNMENT

To minimize disturbance associated with roads and pipelines, pipeline corridors will be partially contained within road ROW corridors, where practical. In addition, existing roads within the CD/WIIPA will be utilized to the maximum extent possible.

Where roads or pipelines must cross drainages, construction and installation operations will be designed to protect drainages and timed to coincide with periods of low flow (late summer, fall, winter). Crossings will be at right angles to drainage channels, where possible. Removal and disturbance of riparian/wetland vegetation will be minimized, and these areas will be reclaimed according to site-specific measures developed in accordance with approved U.S. Army Corps of Engineers (COE) and WDEQ best management practices. All appropriate permits and public notices required by the COE will be obtained prior to construction (e.g., Section 404 permits).

A_3.3.1 Roads

New roads generally will follow natural contours and will be constructed in accordance with BLM road standards (BLM 1985, 1991). For roads on slopes of less than 10%, available topsoil will be stripped from the construction area and placed in windrows within the construction ROW by sidecasting with a grader. After road construction (first fall season during temporary or permanent reclamation), the topsoil will be replaced on road outsoles, and these areas will be reseeded (see Sections A_4.0 and A_5.0).

Surface runoff control will be incorporated into all road designs in accordance with BLM standards (BLM 1985, 1991) and will be approved by the BLM. Road grades, ditches, culverts, sediment traps, material cuts and fills, and topsoil and spoil storage areas will be designed and located in the field prior to construction. Road culvert locations and spacings will be approved by the BLM prior to construction and will be in accordance with BLM standards.

A_3.3.2 Pipelines

When constructing and reclaiming pipelines, existing crowned-and-ditched roads will be used for access, where practical, to minimize surface disturbance. Pipelines will follow new or existing roads or other pipelines, wherever practical. Pipeline trenches will not be placed in access road borrow ditches unless no other reasonable locations are available. In addition, gathering pipelines may be installed on the surface in

areas where slopes are greater than 25% and/or where rock outcrops are crossed. Furthermore, when practical, they will be built perpendicular to the contour to minimize the area required for construction.

Clearing of pipeline ROWs will be accomplished with the least amount of disturbance necessary. Vegetation will be removed from pipeline ROWs so as to leave the root systems intact, and the removed vegetation will be spread over disturbed areas to provide protection, nutrient recycling, and a natural seed source. Pipeline trenches will be excavated with a backhoe to minimize disturbance.

Topsoil will generally not be segregated from subsoil during pipeline trenching due to the small size of most pipeline trenches. However, for larger pipelines (e.g., >10 inches in diameter), the BLM may require topsoil salvage from portions of the pipeline ROW. In these areas, vegetation and topsoil will be placed away from construction traffic. Approximately 6 inches of topsoil, or more, if so directed by the BLM, will be removed, and topsoil materials will not be mixed with subsoils.

Construction will occur as soon as possible after clearing and grading to minimize exposure of soils to erosion. However, no construction activities will be allowed when soils are too wet to adequately support construction equipment; this action will reduce the potential for rutting. Subsoil and topsoil materials will be stored in windrows adjacent to pipeline trenches to facilitate backfilling and topsoil replacement.

Clean gravel will be used for the upper 1 ft of fill over backfilled pipeline trenches in perennial and intermittent streams. Silt fences or other sediment filtering devices also will be installed along channel banks where sedimentation is excessive and at the base of all slopes adjacent to wetland/riparian areas. Trench plugs will be employed during pipeline construction at nonflumed drainage crossings to prevent diversion of drainage channel flows into upland portions of pipeline trenches. Application of riprap will be limited to areas where flow conditions prevent vegetative stabilization. Riprap placement and installation will comply with COE permit requirements. Pipeline trenches will be dewatered so no silt-laden water flows into drainage channels. Where vegetation is disturbed, temporary sediment barriers such as silt fences and/or staked weed-free straw bales will be installed along the topographic contour at the base of slopes adjacent to the ROW crossing. Temporary sediment barriers will remain in place until permanent revegetation measures have been judged successful by the BLM.

A_4.0 TEMPORARY RECLAMATION

Temporary reclamation will occur on all areas where permanent reclamation is not promptly applied and on areas that may be disturbed during final reclamation. Disturbed areas subject to temporary reclamation include road cut_and_fill areas, portions of each wellpad and ancillary facility site not needed for production-related activities, and topsoil and subsoil stockpiles. Temporary reclamation measures will be applied only as needed, since permanent reclamation measures will be applied concurrently with the completion of most specific project activities.

Temporary reclamation objectives include:

- stabilization of disturbed areas by providing wind and water erosion control to reduce soil loss and the chance of slope failure,
- minimization of surface runoff to prevent the degradation of downstream receiving waters through the use of pollution control techniques (e.g., facility sites will be required to approach zero runoff from the location, using interception ditches, berms, or other structures to capture accidental spills),
- establishment of plant communities to protect soil resources, and
- minimization of visual impacts.

Upon completion of a specific development activity (e.g., road construction, well testing), the area to be temporarily reclaimed will be delineated. For example, all road topsoil storage in outslope areas, as well as the potentially disturbed outer portions of road ROWs, will be stabilized and reseeded until permanent road reclamation is initiated.

Disturbed areas will be graded and contoured to slopes of 3:1 (horizontal:vertical) or less as required to stabilize the area and to provide a suitable seedbed. Contoured areas will be ripped, as necessary, to reduce soil compaction. Ripping in many areas may be conducted after topsoil replacement. Temporary erosion control measures (e.g., waterbars, mulch application, biodegradable netting installation) also will be applied as necessary. To minimize sedimentation of drainage channels and wetlands during the interim period between construction activity and final reclamation, temporary erosion and sediment control measures will be applied. Silt fences or other sediment filtering devices such as weed-free straw bales will be installed at drainage channel banks where sedimentation is excessive and at the base of all slopes adjacent to wetland/riparian areas. Sediment filtering devices will be cleaned out and maintained in functional condition throughout the LOP. To avoid the possibility of mulching materials entering waterways, loose mulch (i.e., mulch not crimped into the soil surface, tackified, or incorporated into erosion control blankets) will not be applied to drainage channel banks.

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Table A-4.1 Temporary Reclamation Seed Mixture and Seeding Rates.¹

Species	Seeding Rate (PLS/acre) ²
Western wheatgrass (<i>Elymus smithii</i>)	2.0
Slender wheatgrass (<i>Elymus trachycaulum</i>)	2.0
Streambank wheatgrass (<i>Elymus riparium</i>)	2.0
Wild blue flax (<i>Linum lewisii</i>)	1.0
Winter wheat (<i>Triticum aestivum</i>) ³	10.0
Total	17.0

¹ Alternative species may be reseeded in areas where permanent reclamation may be warranted and/or where the establishment of proposed species is repeatedly deemed unsuccessful.

² PLS/acre = pounds of pure live seed per acre; alternate seeding rates may be applied in some areas as deemed appropriate by the BLM and specified in approved Surface Use Plans, Plans of Development, and/or ERRPs.

³ A sterile hybrid will be seeded as cover crop; cover crops would be used only in areas where rapid site stabilization is desired and where further reseeding efforts likely would be conducted. After topsoil replacement and preparation, the area will be seeded at the first appropriate opportunity, but within 2 years, using a temporary seed mixture developed to facilitate the rapid establishment of vegetation (TableA_4.1). Areas that have been seeded will be visually monitored for seedling establishment and the presence of erosional features and will be restabilized and reseeded, as necessary, until adequate vegetation establishment and site stability is achieved (see Figure A_1.1 and Section A_6.0). In general, the permanent reclamation and success monitoring procedures specified in Sections A_5.0 and A_6.0 also will be applied at temporary reclamation sites.

A_5.0 PERMANENT RECLAMATION

Disturbed areas will be permanently reclaimed as soon as practical, but within 2 years of the determination that these areas are no longer required for the project. Permanent reclamation objectives include all those listed for temporary reclamation (see Section A_4.0), plus the following:

- the re-establishment of self_sustaining native vegetation communities that meet or exceed predisturbance parameters for cover, production, and diversity, as measured at adjacent undisturbed areas;
- the development of hydrologically stable landforms that meet future land uses including livestock grazing, wildlife habitat, recreation, and mineral exploration; and
- the restoration of the visual quality of the area such that it approximates the visual quality of adjacent undisturbed areas in line, form, color, and texture.

A_5.1 FACILITY AND STRUCTURE REMOVAL

All gas and water wells will be abandoned according to relevant BLM and/or Wyoming Oil and Gas Conservation Commission (WOGCC) recommendations. All aboveground wellpad, pipeline, gas processing, and water disposal facilities, including buildings, structures, tanks, reserve pits, flare pits, evaporation pits, and associated hardware, will be dismantled and removed from the site after they are no longer needed. These materials will be salvaged and re-used or disposed of at approved sites.

Any liquid or solid wastes remaining at well locations will be tested and properly disposed of according to state and federal regulations. Reserve or evaporation pit liners will be disposed of according to BLM recommendations by removal to state-approved sites (e.g., Wamsutter landfill) or by appropriate on-site burial. Any concrete foundations, pads, or footings will be adequately broken up and covered or removed. All aggregate used for wellpad, road, and/or ancillary facility site construction also will be removed or suitably buried.

Road reclamation will be conducted as deemed appropriate by the BLM; some roads may remain after project completion. Road reclamation will include the removal of bridges, culverts, cattleguards, sediment control structures, and signs. Drainage-crossing sideslopes will be reduced to no more than 4:1 to reduce bank erosion and produce stable sideslopes. In addition, road barriers or signage to discourage travel on the reclaimed road surface may be required by the BLM.

A_5.2 SURFACE PREPARATION

Surface preparation includes backfilling, grading, and ripping of compacted soils. Additionally, where wetlands have been disturbed and where soil structure contributes to wetland form and function, soils will be compacted to appropriate depths and densities to retain wetland function. In some temporarily reclaimed areas, topsoil removal and short-term storage may also be required.

A_5.2.1 Backfilling and Grading

All disturbed areas will be backfilled and graded (recontoured) to restore disturbed areas to the approximate original contour after facilities and equipment have been removed. Cut_and-fill slopes will be reduced to 3:1 or less. Grading will provide a surface suitable for the replacement of a uniform depth of topsoil, while promoting cohesion between subsoil and topsoil layers, reducing wind erosion, and facilitating moisture capture.

Specialized grading techniques will be applied as necessary and may include slope rounding, bench grading, stair-step grading, and/or contour furrowing. Generally these processes are accomplished either with scrapers or motor graders. Equipment selection will be determined on a site-specific basis dependent on the material to be graded, the size of the area, on-site operating conditions, and equipment availability.

Areas generally requiring backfilling and/or grading include reserve pits, evaporation pits, pipeline trenches, cut-and-fill areas, and any additional areas where unsuitable voids exist or excess fill material has been stockpiled. No visible soil berm (i.e., in excess of 3 inches) will be provided above pipeline trenches. Operator-provided reclamation specialists will ensure that backfilling and grading operations are conducted so as to provide a landscape suitable for successful reclamation.

A_5.2.2 Ripping

Compacted areas such as roads and wellpads will be ripped to a depth of approximately 2 ft to improve soil aeration, water infiltration, and root penetration. Ripping will be accomplished with a motor grader or a tractor using an appropriate attachment. Ripper shanks will be set approximately 1 to 2ft apart. Waterbars and erosion control devices will be installed on reclaimed areas prior to topsoil replacement, as necessary, to control topsoil erosion (see Section A_5.5).

A_5.3 SEEDBED PREPARATION

Seedbed preparation maximizes seeding efficiency and improves reclamation success. It includes topsoil replacement (with amendments, where appropriate) and discing.

A_5.3.1 Topsoil Replacement

All topsoil salvaged during construction will be uniformly redistributed on the area to be reclaimed to depths of at least 6 inches, or more (up to 12 inches) if readily available, using a scraper or dozer, as appropriate, for the material and site. Topsoil replacement will be scheduled immediately prior to seeding to maximize the potential for seedling establishment. Topsoil may require inoculation with soil microorganisms or fertilization at some locations to facilitate plant establishment and growth. Since precipitation in the CD/WIIPA is low, fertilizers generally will not be applied. Fertilizers will not be utilized proximal to open waters.

A_5.3.2 Discing

After topsoil replacement, newly topsoiled areas will be disced, harrowed, or ripped to reduce soil compaction, break up soil clods, improve root and water penetration, and provide a friable but firm seedbed. The Operator-provided reclamation specialist will determine how discing or harrowing will be accomplished. Generally, discing will be accomplished using a tractor-drawn implement set 2-6 inches deep.

A_5.4 REVEGETATION PRACTICES

A_5.4.1 Seeding

Reclaimed areas will be seeded using specific native species and seeding rates for the various soil and vegetation types present on the CD/WIIPA (Tables A_5.1-A_5.9). All seeds utilized for this project will be certified weed free. The proposed seed mixes were developed based on the following criteria: general conditions within the analysis area; species adaptations to site conditions; usefulness of the species for rapid site stabilization; species success in past revegetation efforts; seed costs and availability; and compliance with Executive Order 11987 and BLM Manual Section 1745 (i.e., use of native species only). Certain introduced species have been successfully used for reclamation in the region; these species may have utility in site stabilization and revegetation where revegetation efforts with native species repeatedly have been unsuccessful. Operators will consult with the BLM and acquire BLM approval prior to the use of introduced species. Seed mixtures applied during revegetation will be designed in coordination with the BLM during the APD and ROW application approval processes.

Final determination of the appropriate seed mixture will be developed on a site-specific basis in coordination with the BLM at the time of field review (APD and ROW application review). Selected seed species may be inoculated with soil microorganisms to facilitate germination and growth. Soil and watershed protection will

be emphasized when reclaiming disturbed areas. Areas not exhibiting successful revegetation, as determined during monitoring (see Section A_6.0) will be reseeded and/or improved with soil amendments as deemed necessary by the BLM until adequate vegetative cover is established.

Seeding generally will be done in the fall between September 16 and freeze-up; however, some areas may be seeded in the early spring between spring thaw and April 15. Wherever possible, seed planting will be done along the contour using a rangeland drill equipped with an agitator and depth bands to mix seed and ensure proper seeding depths. Seeds will be planted 0.25 to 1.50 inches deep; most seeds will be planted 0.25 inches deep. When drill seeding is not practical due to steep slopes or wet soil conditions, broadcast seeding will be employed, seeding rates will be doubled, and the area will be raked or chained to cover seeds. To facilitate seed establishment, broadcast seeding may be used for shrub and forb species, utilizing either hand or specialized broadcast seeders; fluffy seeds (e.g., winterfat) may be broadcast simultaneously with drill seeds. In addition, at sites where rapid shrub and/or tree establishment is desirable, bare-rooted or containerized stock may be hand-planted. Depending on site-specific circumstances, broadcast seeding may be accomplished following mulch and crimping operations.

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Table A-5.1 Permanent Reclamation Species List for Sagebrush-dominated Communities.¹

Species	Seeding Rate (PLS/acre) ²
Grasses	
Thickspike wheatgrass (<i>Elymus dasystachyum</i>)	2.0
Western wheatgrass (<i>Elymus smithii</i>)	2.0
Bluebunch wheatgrass (<i>Elymus spicatum</i>)	2.0
Bottlebrush squirreltail (<i>Sitanion hystrix</i>)	2.0
Indian ricegrass (<i>Oryzopsis hymenoides</i>)	2.0
Needle-and-thread (<i>Stipa comata</i>)	2.0
Forbs	
Scarlet globemallow (<i>Sphaeralcea coccinea</i>)	1.0
Wild blue flax (<i>Linum lewisii</i>)	0.5
Shrubs	
Wyoming big sagebrush (<i>Artemisia tridentata wyomingensis</i>)	0.5
Antelope bitterbrush (<i>Purshia tridentata</i>)	1.0
Total	15.0

¹ This seed mix may be modified based on site-specific conditions, the identification of additional useful species for rapid site stabilization, species success in past revegetation efforts, and seed availability and cost.

² PLS/acre = pounds of pure live seed per acre; alternative seeding rates may be applied in some areas as deemed appropriate by the BLM and specified in approved Surface Use Plans.

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Table A-5.2 Permanent Reclamation Species List for Greasewood-dominated Fans and Flats.¹

Species	Seeding Rate (PLS/acre) ²
Grasses	
Western wheatgrass (<i>Elymus smithii</i>)	3.0
Thickspike wheatgrass (<i>Elymus dasystachyum</i>)	2.0
Alkali sacaton (<i>Sporobolus airoides</i>)	2.0
Bottlebrush squirreltail (<i>Sitanion hystrix</i>)	2.0
Forbs	
Scarlet globemallow (<i>Sphaeralcea coccinea</i>)	1.0
Evening primrose (<i>Oenothera</i> sp.)	3.0
Shrubs	
Black greasewood (<i>Sarcobatus vermiculatus</i>)	1.0
Gardner saltbush (<i>Atriplex gardneri</i>)	1.0
Total	15.0

¹ This seed mix may be modified based on site-specific conditions, the identification of additional useful species for rapid site stabilization, species success in past revegetation efforts, and seed availability and cost.

² PLS/acre = pounds of pure live seed per acre; alternative seeding rates may be applied in some areas as deemed appropriate by the BLM and specified in approved Surface Use Plans.

Table A-5.3 Permanent Reclamation Species list for Mixed Desert Shrub Communities.¹

Species	Seeding Rate (PLS/acre) ²
Grasses	
Western wheatgrass (<i>Elymus smithii</i>)	2.0
Bluebunch wheatgrass (<i>Elymus spicatum</i>)	2.0
Great basin wildrye (<i>Elymus cinereus</i>)	2.0
Indian ricegrass (<i>Oryzopsis hymenoides</i>)	2.0
Needle-and-thread (<i>Stipa comata</i>)	1.0
Sandberg bluegrass (<i>Poa sandbergii</i>)	1.0
Forbs	
Scarlet globemallow (<i>Sphaeralcea coccinea</i>)	1.0
Common yarrow (<i>Achillea millefolium</i>)	1.0
Wild blue flax (<i>Linum lewisii</i>)	1.0
Northern sweetvetch (<i>Hedysarum boreale</i>)	1.0
Shrubs	
Wyoming big sagebrush (<i>Artemisia tridentata wyomingensis</i>)	0.5
Rubber rabbitbrush (<i>Chrysothamnus nauseosus</i>)	1.0
Common winterfat (<i>Krascheninnikovia lanata</i>)	1.0
Shadscale (<i>Atriplex confertifolia</i>)	2.0
Total	18.5

¹ This seed mix may be modified based on site-specific conditions, the identification of additional useful species for rapid site stabilization, species success in past revegetation efforts, and seed availability and cost.

² PLS/acre = pounds of pure live seed per acre; alternative seeding rates may be applied in some areas as deemed appropriate by the BLM and specified in approved Surface Use Plans.

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Table A-5.4 Permanent Reclamation Species List for Badlands (Basin Exposed Rock and Soil) Communities.¹

Species	Seeding Rate (PLS/acre) ²
Grasses	
Sheep fescue (<i>Festuca ovina</i>)	3.0
Bottlebrush squirreltail (<i>Sitanion hystrix</i>)	3.0
Alkali sacaton (<i>Sporobolus airoides</i>)	3.0
Forbs	
Gooseberryleaf globemallow (<i>Sphaeralcea grossulariaefolia</i>)	1.0
Northern sweetvetch (<i>Hedysarum boreale</i>)	2.0
Evening primrose (<i>Oenothera</i> sp.)	1.0
Shrubs	
Winterfat (<i>Krascheninnikovia lanata</i>)	1.0
Gardner saltbush (<i>Atriplex gardneri</i>)	1.0
Total	15.0

¹ This seed mix may be modified based on site-specific conditions, the identification of additional useful species for rapid site stabilization, species success in past revegetation efforts, and seed availability and cost.

² PLS/acre = pounds of pure live seed per acre; alternative seeding rates may be applied in some areas as deemed appropriate by the BLM and specified in approved Surface Use Plans.

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Table A-5.5 Permanent Reclamation Species List for Saltbush Fans and Flats Communities.¹

Species	Seeding Rate (PLS/acre) ²
Grasses	
Sandberg bluegrass (<i>Poa sandbergii</i>)	1.0
Western wheatgrass (<i>Elymus smithii</i>)	1.0
Thickspike wheatgrass (<i>Elymus dasystachyum</i>)	1.0
Alkaligrass (<i>Puccinellia distans</i>)	2.0
Bottlebrush squirreltail (<i>Sitanion hystrix</i>)	1.0
Alkali sacaton (<i>Sporobolus airoides</i>)	2.0
Forbs	
Gooseberryleaf globemallow (<i>Sphaeralcea grossulariaefolia</i>)	1.0
Northern sweetvetch (<i>Hedysarum boreale</i>)	2.0
Evening primrose (<i>Oenothera</i> sp.)	1.0
Shrubs	
Winterfat (<i>Krascheninnikovia lanata</i>)	1.0
Gardner saltbush (<i>Atriplex gardneri</i>)	1.0
Shadscale (<i>Atriplex confertifolia</i>)	1.0
Black greasewood (<i>Sarcobatus vermiculatus</i>)	1.0
Total	16.0

¹ This seed mix may be modified based on site-specific conditions, the identification of additional useful species for rapid site stabilization, species success in past revegetation efforts, and seed availability and cost.

² PLS/acre = pounds of pure live seed per acre; alternative seeding rates may be applied in some areas as deemed appropriate by the BLM and specified in approved Surface Use Plans.

Table A-5.6 Permanent Reclamation Species List for Wetland/Riparian Communities.¹

Species	Seeding Rate (PLS/acre) ²
Grasses/Grass-like	
Streambank wheatgrass (<i>Elymus riparius</i>)	1.0
Nebraska sedge (<i>Carex nebrascensis</i>)	1.0
Beaked sedge (<i>Carex rostrata</i>)	1.0
Redtop (<i>Agrostis stolonifera</i>)	1.0
Bluejoint reedgrass (<i>Calamagrostis canadensis</i>)	1.0
Tufted hairgrass (<i>Deschampsia caespitosa</i>)	2.0
Alkali bulrush (<i>Scirpus maritimus</i>)	2.0
Cattail (<i>Typha latifolia</i>)	0.5
Forbs	
Northern sweetvetch (<i>Hedysarum boreale</i>)	1.0
Blue-leaf aster (<i>Aster glaucodes</i>)	1.0
Golden banner (<i>Thermopsis montanus</i>)	1.0
Red clover (<i>Trifolium pratense</i>)	1.0
Shrubs/Trees³	
Golden currant (<i>Ribes aureum</i>)	1.0
Red osier dogwood (<i>Cornus stolonifera</i>)	1.0
Silver buffaloberry (<i>Shepherdia argentea</i>)	1.0
Woods rose (<i>Rosa woodsii</i>)	1.0
Narrowleaf cottonwood (<i>Populus angustifolia</i>)	NA ⁴
Sandbar willow (<i>Salix exigua</i>)	NA ⁴
Total	17.5

¹ This seed mix may be modified based on site-specific conditions, the identification of additional useful species for rapid site stabilization, species success in past revegetation efforts, and seed availability and cost.

² PLS/acre = pounds of pure live seed per acre; alternative seeding rates may be applied in some areas as deemed appropriate by the BLM and specified in approved Surface Use Plans.

³ Planting of shrubs and trees will be dependent on site-specific riparian objectives.

⁴ Planted as containerized stock, sprigs, or poles.

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Table A-5.7 Permanent Reclamation Species List for Mixed Grass Prairie Communities.¹

Species	Seeding Rate (PLS/acre) ²
Grasses	
Western wheatgrass (<i>Elymus smithii</i>)	2.0
Thickspike wheatgrass (<i>Elymus dasystachyum</i>)	3.0
Slender wheatgrass (<i>Elymus trachycaulum</i>)	2.0
Indian ricegrass (<i>Oryzopsis hymenoides</i>)	2.0
Bottlebrush squirreltail (<i>Sitanion hystrix</i>)	1.0
Needle-and-thread (<i>Stipa comata</i>)	1.0
Green needlegrass (<i>Stipa viridula</i>)	2.0
Forbs	
Wild blue flax (<i>Linum lewisii</i>)	2.0
Scarlet globemallow (<i>Sphaeralcea coccinea</i>)	2.0
Total	17.0

¹ This seed mix may be modified based on site-specific conditions, the identification of additional useful species for rapid site stabilization, species success in past revegetation efforts, and seed availability and cost.

² PLS/acre = pounds of pure live seed per acre; alternative seeding rates may be applied in some areas as deemed appropriate by the BLM and specified in approved Surface Use Plans.

Table A-5.8 Permanent Reclamation Species List for Playas and Alkaline Areas.¹

Species	Seeding Rate (PLS/acre) ²
Grasses	
Muhly (<i>Muhlenbergia</i> spp.)	2.0
Alkaligrass (<i>Puccinellia distans</i>)	3.0
Alkali sacaton (<i>Sporobolus airoides</i>)	2.0
Western wheatgrass (<i>Elymus smithii</i>)	2.0
Forbs	
Gooseberryleaf globemallow (<i>Sphaeralcea grossulariaefolia</i>)	1.0
Strawberry clover (<i>Trifolium fragiferum</i>)	2.0
Northern sweetvetch (<i>Hedysarum boreale</i>)	2.0
Shrubs	
Gardner saltbush (<i>Atriplex gardneri</i>)	1.0
Black greasewood (<i>Sarcobatus vermiculatus</i>)	1.0
Total	16.0

¹ This seed mix may be modified based on site-specific conditions, the identification of additional useful species for rapid site stabilization, species success in past revegetation efforts, and seed availability and cost.

² PLS/acre = pounds of pure live seed per acre; alternative seeding rates may be applied in some areas as deemed appropriate by the BLM and specified in approved Surface Use Plans.

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Table A-5.9 Permanent Reclamation Species List for Stabilized Sand Dune Communities.¹

Species	Seeding Rate (PLS/acre) ²
Grasses	
Prairie sandreed (<i>Calamovilfa longifolia</i>)	3.0
Bluebunch wheatgrass (<i>Elymus spicatum</i>)	1.0
Sand dropseed (<i>Sporobolus cryptandrus</i>)	1.0
Indian ricegrass (<i>Oryzopsis hymenoides</i>)	2.0
Needle-and-thread (<i>Stipa comata</i>)	1.0
Basin wildrye (<i>Elymus cineris</i>)	1.0
Forbs	
Gooseberryleaf globemallow (<i>Sphaeralcea grossulariaefolia</i>)	1.0
Desert Indian paintbrush (<i>Castilleja chromosa</i>)	1.0
Northern sweetvetch (<i>Hedysarum boreale</i>)	1.0
Wild blue flax (<i>Linum lewisii</i>)	1.0
Shrubs	
Wyoming big sagebrush (<i>Artemisia tridentata wyomingensis</i>)	1.0
Rubber rabbitbrush (<i>Chrysothamnus nauseosus</i>)	1.0
Spiny hopsage (<i>Grayia spinosa</i>)	1.0
Douglas rabbitbrush (<i>Chrysothamnus vicidiflorus</i>)	1.0
Total	17.0

¹ This seed mix may be modified based on site-specific conditions, the identification of additional useful species for rapid site stabilization, species success in past revegetation efforts, and seed availability and cost.

² PLS/acre = pounds of pure live seed per acre; alternative seeding rates may be applied in some areas as deemed appropriate by the BLM and specified in approved Surface Use Plans. Operators will consult with the BLM and acquire BLM approval prior to the use of introduced species. Seed mixtures applied during revegetation will be designed in coordination with the BLM during the APD and ROW application approval processes.

Final determination of the appropriate seed mixture will be developed on a site-specific basis in coordination with the BLM at the time of field review (APD and ROW application review). Selected seed species may be inoculated with soil microorganisms to facilitate germination and growth. Soil and watershed protection will be emphasized when reclaiming disturbed areas. Areas not exhibiting successful revegetation, as determined during monitoring (see Section A_6.0) will be reseeded and/or improved with soil amendments as deemed necessary by the BLM until adequate vegetative cover is established.

Seeding generally will be done in the fall between September 16 and freeze-up; however, some areas may be seeded in the early spring between spring thaw and April 15. Wherever possible, seed planting will be done along the contour using a rangeland drill equipped with an agitator and depth bands to mix seed and ensure proper seeding depths. Seeds will be planted 0.25 to 1.50 inches deep; most seeds will be planted 0.25 inches deep. When drill seeding is not practical due to steep slopes or wet soil conditions, broadcast seeding will be employed, seeding rates will be doubled, and the area will be raked or chained to cover seeds. To facilitate seed establishment, broadcast seeding may be used for shrub and forb species, utilizing either hand or specialized broadcast seeders; fluffy seeds (e.g., winterfat) may be broadcast simultaneously with drill seeds. In addition, at sites where rapid shrub and/or tree establishment is desirable, bare-rooted or containerized stock may be hand-planted. Depending on site-specific circumstances, broadcast seeding may be accomplished following mulch and crimping operations.

A_5.4.2 Mulching

Immediately following seeding, selected areas with a high erosion potential, including steeply sloped areas along roads and/or pipelines, will be uniformly mulched (75% minimum cover) with native grass, hays, small grain straw, wood fiber, and/or live mulch, at a rate of approximately 1.0-2.0 tons/acre. Cotton, jute, or synthetic netting also may be applied at some sites. Only certified weed-free mulches will be used, thereby minimizing the potential for noxious weed introduction. Mulch will be crimped in place, as necessary, using a serrated disc crimper or similar implement. Mulch protects the soil from wind and water erosion, raindrop impact, and surface runoff and holds seeds in place. On slopes of greater than 30% or exceeding the operating limits of the equipment, sites containing 35% surface rock content, sandy soil areas, or other unstable areas, hydromulch, biodegradable erosion control netting, rock mulch, or matting attached firmly to the soil surface will be applied, as necessary.

A_5.5 SEDIMENTATION AND EROSION CONTROL DEVICES

Erosion and sediment control measures and structures will be installed, as appropriate, on all reclaimed areas. The type of control measure used will depend on slope gradient and the susceptibility of disturbed soils to wind and water erosion. Runoff control along linear disturbances such as roads and pipelines will be accomplished using standard measures, including but not limited to waterbars, silt fences, energy dissipators, mulches, and cross ditches. Waterbars will be installed in accordance with BLM specifications and will discharge water into undisturbed vegetation. Waterbars generally will be 12_18 inches deep. When used, silt fences will be placed at the base of all steep fill slopes and will be installed using manufacturer's directions and BLM regulations to prevent overland flow from washing beneath or around the structures. Instream protection devices (e.g., drop structures) also may be required to prevent erosion in drainages crossed by pipelines. Information on the techniques to be implemented, as determined based on site-specific conditions and associated BLM interdisciplinary team requirements, will be included in APDs, ROW applications, and/or Sundry Notice Surface Use Plans, Plans of Development, and/or ERRPs.

Additional runoff and erosion control along ROWs will be accomplished by implementing standard cross drain, culvert, road ditch, and turnout design, as well as timely stabilization and revegetation of exposed areas. Culvert entrances and exits will be riprapped or protected with energy dissipators or other scour_reducing techniques, as needed and where appropriate. Water discharged from culverts, cross drains, road ditches, and turnouts will be directed appropriately either into undisturbed vegetation or natural drainages. Erosion and sedimentation control measures and structures, as approved by the BLM, will be installed across all cut-and-fill slopes within 100 ft of drainage channels. All runoff and erosion control structures will be

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inspected by Operators annually and after major runoff events and will be maintained (e.g., cleaned out) throughout the LOP.

A_6.0 RECLAMATION SUCCESS MONITORING

Reclamation success will be based on the objectives specified in this plan, and monitoring will occur annually or at shorter intervals until reclamation efforts are deemed successful by the BLM. Monitoring activities will evaluate the condition of reclamation efforts, determine the prognosis for reclamation success, and determine the need for remediation. The actual monitoring procedures for quantitative and qualitative evaluations of reclamation success will be implemented as specified in Surface Use Plans or Plans of Development and approved by the BLM. Standard revegetation success criteria involve the attainment of 50% of predisturbance vegetation leaf or ground cover in 3 years and 80% of predisturbance vegetation leaf or ground cover in 5 years; however, alternative revegetation success criteria (e.g., time frames, percent cover values) may be developed on a site-specific basis as established by BLM on-site interdisciplinary teams (IDTs) (BLM 1997).

The monitoring program presented herein is designed to provide an approach to reclamation monitoring on the CD/WIIPA and includes evaluations which will assist in making future land management decisions in the area. More specific objectives include:

- delineation of BLM and Operator monitoring responsibilities,
- identification of reclamation success criteria, and
- specification of monitoring protocols.

Both temporary and permanent reclamation success will be monitored. Temporary reclamation monitoring will include visual observations of soil stability, effectiveness of erosion control practices, and qualitative evaluations of vegetation establishment and assessments of weed invasion. Operators will be responsible for weed control on surface disturbance and reclamation sites. Control measures will adhere to those specified by the BLM. If chemical weed controls are deemed to be necessary by the BLM, chemicals will be used only in the season or growth stage during which they are most effective. In addition, they will be applied only by certified personnel using approved precautions, application methods, and rates in compliance with all applicable federal, state, and local regulations. Use of herbicides will be avoided near open waters or during extremely windy conditions.

Permanent reclamation will be visually monitored for soil stability, particularly near wetland/riparian areas, open waters, or ephemeral stream channels. Mulch effectiveness and other erosion control devices will be assessed, and qualitative evaluations of vegetation establishment and success will be made. Quantitative measurements for vegetation success as measured by percent leaf and ground cover, production, shrub establishment, and/or measures of diversity will be implemented as specified by the BLM. If reclamation monitoring reveals that soil stability, weed abundance, or vegetation establishment/productivity do not meet required standards, additional treatments will be promptly undertaken by Operators in cooperation with the BLM. Continued efforts will be required until satisfactory cover and productivity are achieved and the site is adequately stabilized. Additional treatments could include, but are not limited to, installation of additional erosion control devices, fencing, herbicide or fertilizer application, reseeding, or remulching.

A_6.1 MONITORING RESPONSIBILITY

Reclamation monitoring will be the responsibility of the BLM and the Operators. Monitoring will be accomplished through joint coordinated monitoring efforts. Further detail on BLM/Operator monitoring responsibilities will be provided in site-specific Surface Use Plans and/or ERRPs.

Operators will submit an initial monitoring plan, including monitoring locations, time frames, and methodologies, for each proposed disturbance in Surface Use Plans or ERRPs, and plans will be approved by the BLM prior to disturbance. The initial monitoring plan will constitute the Implementation Phase of monitoring and will follow the guidelines presented in Addendum A-A (FORM I) of this appendix. Monitoring will be conducted by a qualified Operator representative (in coordination with the BLM) following initial rehabilitation work. Monitoring areas will be re_examined at the end of the first growing season. Results will be documented in a report (see AddendumA_B, FORMII) to the BLM. Problem areas identified during monitoring will receive follow-up rehabilitation/erosion control measures.

During the second growing season, the BLM will revisit established monitoring sites. Original methodologies will be repeated and the status of reclamation efforts will be assessed using the guidelines established in FORMII (AddendumA_B). Results will be documented and a report prepared. Monitoring results will be provided to each Operator to show progress and call attention to additional stabilization/reclamation needs. Additional monitoring sites will be established by the BLM (in coordination with the Operator) for long-term monitoring on significant problem areas not covered by initial efforts.

Follow-up monitoring using the established sites and methodologies will be conducted annually or as necessary by the BLM until reclamation goals are attained (see SectionA_6.3). Once reclamation goals are attained, the monitoring site may be abandoned; however, reference points will remain to allow for potential future evaluation. It is expected that most monitoring sites will reveal adequate site reclamation within approximately 5 years, and therefore monitoring activities usually will be discontinued after 5 years. This will allow personnel to concentrate on monitoring installation and evaluation on long-term problem sites. Operators will be advised of reclamation status through joint review of monitoring sites. Annual reports will continue, as will direction for additional remedial reclamation efforts, if necessary.

Generally, reclamation success will be based on site-specific potential. Revegetation objectives and success criteria (FORM I) will be tailored to site potential and agreed on by both Operators and the BLM. When the site has reached long-term stabilization and the composition of desired forage is consistent with the above objectives and criteria, the monitoring site will be abandoned. Monitoring data will be compiled by the BLM to provide future guidance for successful reclamation planning.

A_6.2 MONITORING PROTOCOL

The forms presented in Addenda A and B serve as guidelines for the collection of site_specific information, identification of revegetation success standards, documentation of treatments, and a record for evaluation.

The monitoring plan contained in Surface Use Plans and/or ERRPs will cover the parameters outlined on the Revegetation and Erosion Monitoring/ Background Data form (AddendumA_A, FORMI) and will identify the Operators that will collect these data. Background data will be collected following initial reclamation work. A report containing this information will be prepared prior to annual reviews. Data collection will be accomplished using point sampling transects on adjacent undisturbed areas of the same vegetation type. These transects will be established with permanent stakes on locations described in Surface Use Plans and/or ERRPs.

The Revegetation and Erosion Monitoring Evaluation form (AddendumA_B, FORMII) will be used for annual monitoring conducted by the Operators during the first growing season and by the BLM in subsequent years and until monitoring ceases. Data collection will take place during the seed-ripe stage of plant development, and evaluation reports containing this information will be prepared for annual reviews.

A_6.3 GENERAL SUCCESS CRITERIA

The following general success criteria will be used to determine the attainment of adequate site rehabilitation and whether bond liability should be released; alternative criteria (e.g., time frames, percent cover values) may be developed site-specifically based on BLM IDT on-site determinations. Additional success criteria (e.g., productivity, diversity, shrub establishment) will be included, as necessary, in site_specific Surface Use Plans, Plans of Development, or ERRPs and will be approved by the BLM prior to site disturbance. Interim reclamation criteria (see Section A-6.3.2) generally will be applied for determining the disturbance limit thresholds identified for project development Alternatives A and B (see EIS Sections 2.2 and 2.3).

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A 6.3.1 General Criteria

- There will be no contaminated materials remaining at or near the surface, and all buried undesirable materials will be physically isolated for long-term stabilization.
- The subsurface will be stabilized, holes will be plugged, and subsurface integrity will be ensured. No indications of open or unplugged holes, subsidence, slumping, and/or significant downward movement of surface soil materials will be visible.
- The reclaimed area will be stable and will not exhibit large rills or gullies (e.g., 3 inches wide/deep), perceptible soil movement or head cutting in drainage, and/or slope instability on or adjacent to the reclaimed area.
- The soil surface will be stable and have adequate surface roughness to reduce runoff and capture rainfall and snow melt.
- Vegetative canopy cover, production, and species diversity will approximate the surrounding undisturbed areas. The vegetation will stabilize the site and support postdisturbance land uses, provide for natural plant community succession and development, and be capable of renewing itself. There will be evidence of successful on-site establishment of species included in the planting mixture or other desirable species and/or evidence of vegetation reproduction, either spreading by rhizomatous species or seed production.
- The reclaimed landscape will have characteristics that approximate the visual quality of the adjacent area with regard to location, scale (e.g., line, form, and texture), shape, color, and orientation of major landscape features and will meet the needs of the postdisturbance land uses.
- During and following reclamation activities, Operators will monitor and protect the reclaimed landscape to help ensure reclamation success until the liability and bond are released. Each of the previous six standards will be maintained until it can be determined that the reclamation effort was successful.
- With the exception of active work areas, all disturbed highly erosive or sensitive areas to be left bare or unreclaimed for more than 3 months will have a protective cover of suitable material in the form of mulch, matting, or vegetative growth. All other disturbed areas will have an effective protective cover within 1 year.

A 6.3.2 Interim Reclamation Criteria (Years Two - Five)

- Seeding density. The density and abundance of desirable species will be at least three to four seedlings/ft of drill row (if drilled) or transect (if broadcast) for most areas. In some sparsely vegetated areas such as badlands and sodic and saline/alkaline bottomlands, this standard may be reduced to one to two seedlings/ft to be commensurate with the naturally low vegetative cover, unless significant surface erosion is anticipated.
 - Percent cover. Total vegetative (foliar) or ground cover will be 30-50% of predisturbance cover as measured along the reference transect for establishing baseline conditions.
 - Species diversity. At least 20% of the species contained in the seed mix and/or present on adjacent areas will be present, and no single species will account for more than 50% of the total vegetative cover unless its dominance is higher than 50% on adjacent undisturbed areas.
 - Undesirable species. Weeds or other undesirable species will comprise no more than 10% of the total vegetative cover. All noxious weeds will be controlled.
-

A_6.3.3 Final Reclamation Criteria (Years Three - Ten)

- Percent cover. Total vegetative (foliar) or ground cover will be 50_80% of predisturbance cover as measured along the reference transect for establishing baseline conditions.
 - Dominant species. Ninety percent of therevegetation will consist of species included in the seed mix and/or occurring in the surrounding natural vegetation or as will be deemed desirable by the BLM as measured along the reference transect for establishing baseline conditions.
 - Erosion condition/soil surface factor. Erosion condition of reclaimed areas will be equal to or in better condition than that measured for the reference transect for establishing baseline conditions.
-

A_7.0 REFERENCES

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- _____. 1987. Draft Resource Management Plan/environmental impact statement for the Medicine Bow-Divide Resource Area, Rawlins District, Wyoming, BLM-WY-ES-87-008-4410. U.S. Department of the Interior, Bureau of Land Management. 500pp.
- _____. 1988. Final Resource Management Plan/environmental impact statement for the Medicine Bow-Divide (Great Divide) Resource Area, Rawlins District, Wyoming, BLM-WY-ES-88-015-4410. U.S. Department of the Interior, Bureau of Land Management. 249pp.
- _____. 1990a. Wyoming policy on reclamation. U.S. Department of the Interior, Bureau of Land Management, Rawlins District Office, Rawlins, Wyoming. February 2, 1990.
- _____. 1990b. Great Divide Resource Area Record of Decision and approved Resource Management Plan, BLM-WY-PT-91-010-4410. U.S. Department of the Interior, Bureau of Land Management, Great Divide Resource Area, Rawlins District, Rawlins, Wyoming. 74pp.
- _____. 1991. Wyoming supplement to the Bureau 9113 Manual. U.S. Department of the Interior, Bureau of Land Management, Wyoming State Office, Cheyenne, Wyoming. 16 pp.
- _____. 1992. Green River Resource Area Management Plan and draft environmental impact statement. U.S. Department of the Interior, Bureau of Land Management, Rock Springs District, Rock Springs, Wyoming, BLM-WY-ES-92-019-4410. 901 pp.
- _____. 1996. Green River Resource Area Management Plan and final environmental impact statement. U.S. Department of Interior, Bureau of Land Management, Rock Springs District, Rock Springs, Wyoming, BLM/WY/PL-96/012+1610. 1,009 pp.
- _____. 1997. Rock Springs District reclamation monitoring report 1997. Prepared by J. MacDonald, U.S. Department of the Interior, Bureau of Land Management, Rock Springs District, Rock Springs, Wyoming. 6 pp. + attach.
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ADDENDUM A-A:

FORM I
REVEGETATION AND EROSION
MONITORING/BACKGROUND DATA

FORM I

Page 1 of 3

Revegetation and Erosion Monitoring/Background Data

- A. Revegetation Project Name: _____
Company: _____ Telephone No: (____) _____
Data Collected By: _____ (Company/Agency Representative)
Monitoring Site Number: _____
- B. Legal Location C. Slope % _____ D. Key Species in Reference Vegetation
- | | | |
|------------|--------------------|-----------------|
| Twp. _____ | Aspect _____ | _____ - _____ % |
| Rng. _____ | Elevation _____ | _____ - _____ % |
| Sec. _____ | (include construc- | _____ - _____ % |
| Sub. _____ | tion map with | _____ - _____ % |
| | transect site | _____ - _____ % |
| | marked) | _____ - _____ % |
- E. Soil: Texture - Rock Content Texture - Rock Content
- | | | | |
|-------------|-----------|--------------|-----------|
| 0-6" _____ | - _____ % | 12-18" _____ | - _____ % |
| 6-12" _____ | - _____ % | 18-24" _____ | - _____ % |
- F. Disturbance Description: Date _____
- G. Revegetation Objective(s): _____
- H. Criteria for Determining Success: _____
- I. Reclamation Treatment Record - Data/season applied: _____
1. Topsoiling: _____
2. Erosion Control (type and method of installation): _____
-

Page 2 of 3 **FORM I, Continued**

3. Soil Amendments (type, amount, and method of application): _____

4. Seed Mix (lbs pure live seed/acre by species): _____

5. Mulch (type and method of application): _____

6. Mechanical treatments (type and rationale): _____

7. Remarks: _____

- J. Attach a 35 mm photograph of the monitoring transect and reference plot (if applicable) with dates. Photograph sites should be clearly marked on a reference map.

Items requiring further explanation:

- B. A 1:24,000 topographic map can be used to attain this information. This report will include the monitoring site transect location on the detailed construction drawings contained in the Surface Use Plans or ERRPs.
 - D. Reference vegetation serves as a standard of comparison to assess potential species for revegetation and success. The nature of comparisons with reference vegetation will depend on revegetation objectives. A reference plot location will be established on the ground and marked on Surface Use Plan and/or ERRP maps. A 35 mm photo of the plot will accompany the form.
 - G. Soil stability, productivity restoration, and wildlife habitat enhancement are general examples of objectives. More specific objectives may be provided.
 - H. Examples of Criteria for Success could include 60% ground cover for erosion control, soil surface factors of less than 45 (see AddendumA_B), specific plant species density and/or diversity requirements for wildlife habitat, and specific production for livestock grazing. Criteria must be defined and measurable.
 - I. The reclamation treatment record will document what was actually done on the ground, not necessarily what is outlined in Surface Use Plans and/or ERRPs. Short explanations of when topsoiling was completed, the erosion control methods used, fertilizer types and rates, seed mixes and seeding rates, mulching methods, etc., will be described in this section. Any additional erosion control measures should be included under remarks.
 - J. A photo record of the transect line and any additional erosion control measures will be included. Each transect will have one photo showing the general view along the transect and one photo showing transect detail of vegetation/soil surface. Date, transect, and direction of view will be labeled on each photo. Permanent photomonitoring points also will be established at appropriate vantage locations of drill sites, pipeline and access road ROWs, and ancillary facility sites. Each photomonitoring point will be permanently marked with rebar and identified on a topographic map of the area. The location of each point will be described in detail to assist in relocation. Photos will be taken at each photomonitoring point prior to initiation of construction. Photos, framing the same scene as previously taken, will be taken at each formal site visit until reclamation standards have been met.
-

ADDENDUM A-B:

FORM II
REVEGETATION AND EROSION
MONITORING EVALUATION

FORM II

Page 1 of 4

Revegetation and Erosion Monitoring Evaluation

- A. Revegetation Project Name: _____
 Company: _____ Telephone No: (____) _____
 Data Collected By: _____ (Company/Agency Representative)
 Monitoring Site Number: _____

B. Revegetation Evaluation:

1. Percent Cover	2. Dominant Species	Relative - Percent
_____ % Plant	_____	-
_____ % Litter	_____	-
_____ % Rock	_____	-
_____ % Bare Ground	_____	-
_____ % Water	_____	-
100 % Total	_____	-
	_____	-
	_____	-
	_____	-

3. Seedling Density & Abundance
_____ : Average plants per linear ft (drill row/transect)
_____ : Rating

4. Grazing Impact (Utilization)
_____ : Utilization
_____ : Rating

5. Weed Investigation: _____

6. Erosion Evaluation (see the attached table): _____

7. Other Comments: _____
-

EROSION EVALUATION: Evaluate conditions 50 ft on either side of transect line. Assign a numerical rating for each category.
(See page 4 of 4 for explanation)

S U R F A C E LITTER	No movement, or if present, less than 2% of the litter has been translocated and redeposited against obstacles. 0 or 3	Between 2 and 10% of the litter has been translocated and redeposited against obstacles. 6	Between 10 and 25% of the litter has been translocated and redeposited against obstacles. 8	Between 25 and 50% of the litter has been translocated and redeposited against obstacles. 11	More than 50% of the litter has been translocated and redeposited against obstacles. 14
SURFACE ROCK MOVEMENT	No movement, or if present, less than 2% of the surface rock fragments have been translocated and/or redeposited against obstacles and show an even distribution on the landscape. 0 or 2	Between 2 and 10% of the surface rock fragments have been translocated/redeposited against obstacles and have begun to show localized concentration. 5	Between 10 and 25% of the surface rock fragments have been translocated, redeposited against obstacles, and show localized concentration. 8	Between 25 and 50% of the surface rock fragments have been translocated, redeposited against obstacles, and show localized concentration. 11	More than 50% of the surface rock fragments have been translocated, redeposited against obstacles, and show extreme localized concentration. 14
PEDESTALLING	Pedestals are mostly less than 0.1inch (2.5 mm) high and/or less frequent than 2 pedestals per 100 ft ² . 0 or 3	Pedestals are mostly between 0.1 and 0.3 inch (2.5 to 8.0mm) high and/or have a frequency of 2 to 5 pedestals per 100 ft ² . 6	Pedestals are mostly between 0.3 and 0.6 inch (8.0 to 15.0mm) high and/or have a frequency of 5 to 7 pedestals per 100 ft ² . 9	Pedestals are mostly between 0.6 and 1.0 inch (15.0 to 25.0mm) high and/or have a frequency of 1 to 10 pedestals per 100 ft ² . 12	Pedestals are mostly over 1.0inch (25.0 mm) high and/or have a frequency of over 10 pedestals per 100ft ² . 14
FLOW PATTERNS	If present, less than 2% of the surface areas shows evidence of recent translocation and deposition of soil and litter. 0 or 3	Between 2 and 10% of the surface area shows evidence of recent translocation and deposition of soil and litter. 6	Between 10 and 25% percent of the surface area shows evidence of recent translocation and deposition of soil and litter. 9	Between 25 and 50% of the surface area shows evidence of recent translocation and deposition of soil and litter. 12	Over 50% of the surface area shows evidence of recent translocation and deposition of soil and litter. 15
RILLS	Rills, if present, are mostly less than 0.5 inch (13.0 mm) deep, and generally at infrequent intervals over 10 ft. 0 or 3	Rills are mostly 0.5 to 1.0 inch (13.0 to 25.0 mm) deep and generally at infrequent intervals over 10 ft. 6	Rills are mostly 1.0 to 1.5inches (25.0 to 38.0 mm) deep and generally at 10-ft intervals. 9	Rills are mostly 1.5 to 3.0inches (38.0 to 76.0 mm) deep and at intervals of 5 to 10ft. 12	Rills are mostly 3.0 to 6.0inches (76.0 to 152.0mm) deep and at intervals of less than 5 ft. 14
GULLIES	No gullies, or if present, less than 2% of the channel bed and walls show active erosion (are not vegetated); gullies make up less than 2% of the total area. 0 or 3	Between 2 and 5% of the channel bed and walls show active erosion (are not vegetated), or gullies make up between 2 and 5% of the total area. 6	Between 5 and 10% of the channel bed and walls shows active erosion (are not vegetated), or gullies make up between 5 and 10% of the total area. 9	Between 10 and 50% of the channel bed and walls show active erosion (are not vegetated), or gullies make up between 10 and 50% of the total area. 12	Over 50% of the channel bed and walls show active erosion (are not vegetated) along their length, or gullies make up over 50% of the total area. 15
SOIL MOVEMENT	Depth of recent deposits around obstacles or in microterraces, and/or depth of truncated areas is between 0 and 0.1 inch (9.0to 2.5 mm) 0 or 3	Depth or recent deposits around obstacles or in microterraces, and/or depth of truncated areas is between 0.1 and 0.2 inch (2.5to 5.0 mm). 5	Depth of recent deposits around obstacles or in microterraces, and/or depth of truncated areas is between 0.2 and 0.4 inch (5.0 to 10.0mm). 8	Depth of recent deposits around obstacles or in microterraces, and/or depth of truncated areas is between 0.4 and 0.8 inch (10.0 to 20.0 cm). 11	Depth of recent deposits around obstacles or in microterraces, and/or depth of truncated areas is over 0.8inch (20.0 cm). 14

Erosion Condition Class: _____ Soil Surface Factor: _____

Items requiring further explanation:

- B.1 Percent cover is determined by examination of points along a 100-ft transect. Documentation consists of recording the total number of hits for plant, litter, rock, and bare ground. Each point noted corresponds to each 1-ft increment along the 100-ft transect. Data summarized from this transect will be recorded here.
- B.2 Dominant plant species along the transect are listed and their relative percent cover determined based on the number of hits for each species.
- B.3 Seedling Density and Relative Abundance is the total number of plants occurring within plots at the 20, 40, 60, and 80-ft mark along the transect. At these points, perennial seedlings per linear ft or drill row (or in the case of broadcast seedling, per linear ft of transect) are recorded and averaged. Ratings are based on the following evaluation system:

PLANTS/LINEAR FT	RATING
8+	Excellent
5-7	Good
3-4	Fair
0-2	Poor

- B.4 The grazing impact is assessed as an ocular estimate of the percent utilization along the transect (at 10-ft intervals). Utilization is based on the removal of seeded species (current year's growth). The amount of utilization is expressed as the percent of aboveground biomass grazed. The following describes the rating for various utilization ranges:

PERCENT UTILIZATION RANGE	RATING	GENERAL DESCRIPTION
1-40	Light	The revegetation may be topped, skimmed, or grazed in patches, 50 to 80% of the number of current seed stalks remain intact. Most young plants are undamaged. There is little or no use of nonpalatable species.
41-60	Moderate	The revegetation appears entirely covered (grazed) as uniformly as natural features and facilities will allow. Fifteen to 25% of the number of current seed stalks remain intact. No more than 10% of the nonpalatable species are utilized.
61-100	Heavy	The revegetation has the appearance of complete and repeated grazing use. Less than 10% of the current seed stalks are remaining. The remaining stubble of preferred grasses may be grazed to the soil surface.

Page 4 of 4

- C. The Erosion Condition Class/Soil Surface Factor method numerically rates soil movement, surface litter, surface rock, pedestalling, flow patterns, and rill/gully formation and translates these physical factors into an evaluation of the vegetation and erosion stability of an area. Results are an expression of current erosion activity and can be used to reflect revegetation success as a function of site stability.
- Identify the numerical factor that most nearly describes the current erosion condition by circling the factors. Evaluate each erosional feature if water erosion is the most prevalent type of erosion. Omit surface rock if not present. If wind erosion is mostly prevalent, do not include rill and gully features in the computation. The following identifies the Erosion Condition Class based on the Soil Surface Factor:

EROSION CONDITION CLASS	SOIL SURFACE FACTOR (Range)
Stable	1_20
Slight	21_40
Moderate	41_60
Critical	61_80
Severe	81_100

APPENDIX B:
TRANSPORTATION PLAN

**DRAFT
TRANSPORTATION PLAN
CONTINENTAL DIVIDE/WAMSUTTER II
NATURAL GAS PROJECT**

Prepared for

**U.S. Bureau of Land Management
Rawlins Field Office
Rawlins, Wyoming**

and

**Rock Springs Field Office
Rock Springs, Wyoming**

By

**Uintah Engineering and Land Surveying
Vernal, Utah**

and

**TRC Mariah Associates Inc.
Laramie, Wyoming
MAI Project 1295**

April 1999

ABBREVIATIONS AND ACRONYMS

APD	Application for Permit to Drill
BLM	Bureau of Land Management
CD/WIIPA	Continental Divide/Wamsutter II Project Area
EIS	Environmental impact statement
GIS	Geographic Information System
GRBAC	Green River Basin Advisory Committee
I-80	Interstate 80
NEPA	<i>National Environmental Policy Act</i>
Network	The network of proposed and existing collector and local roads used within the CD/WIIPA
Operators	Amoco Production Company, other oil and gas companies, and their subcontractors working on the CD/WIIPA
RFO	Rawlins Field Office
ROW	Right-of-way
RSFO	Rock Springs Field Office
TP	Transportation Plan
TPA	Transportation planning area
TPC	Transportation Planning Committee
TPTSD	Transportation Planning Technical Support Document
Truck or heavy truck	All trucks used for hauling equipment or freight or trucks mounted with special equipment with axle weights of under 32,000 lbs and gross weights of under 80,000 lbs. This could also include trucks with overweight or overwidth permits

B-1.0 INTRODUCTION

B-1.1 OBJECTIVES

This Transportation Plan (TP) was prepared to supplement a proposal by oil and gas companies (Operators) to drill new wells in the Continental Divide/Wamsutter II Project Area (CD/WIIPA) (Map B-1.1), as described in the Continental Divide/Wamsutter II Natural Gas Project environmental impact statement (EIS). Additionally, a TP required for the Greater Wamsutter II Project (Bureau of Land Management [BLM] 1995) and this TP, as expanded herein based on the revised development proposal, serves as the TP for the Greater Wamsutter II Project. This document provides an assessment of future road development and use in and around the CD/WIIPA and provides a basis for future oil- and gas-related exploration and production transportation planning within the area. Potential impacts to the existing transportation system are described in the EIS.

Additional information on road development requirements for this project is provided in the Transportation Planning Technical Support Document (TPTSD) (BLM 1999), which is available for review at the BLM Rawlins Field Office (RFO) and Rock Springs Field Office (RSFO). Annual road planning, development, maintenance, and other issues and concerns are provided in the TPTSD, as is detailed information (including maps) on existing roads/routes and natural obstacles. The TPTSD and associated maps will be updated annually or as necessary as specified in Chapter B-4.0.

The transportation planning area (TPA) for this project includes the CD/WIIPA plus adjacent areas that include roads which may be used to access the CD/WIIPA (Map B-1.2). The TPA includes Interstate 80 (I-80) and its on and off ramps from Rawlins west to exit 142; U.S. Highway 287 north of Rawlins to County Road 4-63; State Highway 789 south from I-80; and several county, BLM, and undeveloped roads/routes on and adjacent to the area. (More detailed maps of the TPA are available for review at the BLM RFO and RSFO.)

The use of existing roads and proposed road corridors for local and collector roads is described, and this document, the TPTSD, and applicable transportation codes and standards will be used in the localized planning efforts for each new well location and associated access. Annual operational updates to the TPTSD will be made, as necessary, to detail specific localized transportation networks. All new or upgraded roads in the TPA will conform to the general provisions of this planning document.

The objectives and content of this TP are listed below.

- Public comment opportunities and the issues/concerns raised are identified.
- Existing roads in the TPA which are preliminarily identified as potential project-required collector and local roads are identified on maps, and resource, two-track, and other unimproved roads are also briefly discussed.
- The annual transportation planning/operational update process for the TPTSD is described, and this description includes scheduling, roles and responsibilities, and opportunities for public input.

B-1.2 SCOPE

The scope of this plan includes a brief description/presentation of the existing road network (see Map B-1.2) and the identification of proposed high traffic volume roads/corridors. Relevant requirements for road

construction or reconstruction and the development of agreements for use, rights_of_way (ROWs), and maintenance are identified and outlined in the TPTSD.

This plan also applies to the transportation of gas, condensate, or water via pipelines and electric power transmission (power lines) within the CD/WIIPA. Pipelines and power lines generally will be located adjacent to roads to reduce new surface disturbance. In some instances, paralleling roads and lines may lead to increased environmental impacts, in which case pipelines and power lines may be located along alternative routes, and these alternative routes will be evaluated and sited to minimize environmental impacts. Map 2.2 of the EIS shows the location of major pipeline routes on the CD/WIIPA. Further detail on pipelines is provided in Section 2.6.7 of the EIS.

Some existing roads to and within the CD/WIIPA are under the jurisdiction of the governmental agencies (e.g., BLM, Sweetwater County, Carbon County) who approved their designs and require their maintenance. Roads under private easements between Operators and private landowners may or may not have maintenance requirements or agreements. In addition, there are many non-oil_and-gas roads/routes that are not maintained. Map 2.1 in the EIS illustrates the general location of roads in the CD/WIIPA. Oil and gas field roads may also be under the jurisdiction of government agencies; however, maintenance of these roads is generally conducted by Operators. Maintenance responsibilities are discussed in the TPTSD for this project (BLM 1999). Operators will provide the BLM and Sweetwater and Carbon County officials with copies of road maintenance agreements that include the name of the Operators' designated contact persons. Non-oil_and_gas roads will be maintained as appropriate by the BLM or other ROW holder.

B-1.3 LIMITATIONS

- The condition (e.g., road design, upgrading requirements) and maintenance status (e.g., plowed) of existing roads and casual use routes (e.g., two-tracks) in the TPA are generally identified on maps available for review with the TPTSD at the BLM offices. Many existing roads may not be passable during inclement weather or during winter months. All roads developed and required for this project will need upgrading, maintenance, and winter snow removal. Specific road upgrading and maintenance responsibilities will be identified in annual operational updates to the TPTSD.
- Some existing roads within the TPA may not have public access agreements in place with the BLM and/or private landowner. Except those identified as state or county roads, access may require agreements with private landowners.
- The transportation network described in this document is focused on local and collector roads and potential road corridors; however, existing low traffic volume resource roads and unimproved roads are identified on the detailed maps available for review with the TPTSD at the BLM area offices.

B-2.0 PUBLIC INVOLVEMENT/TRANSPORTATION PLAN SCOPING

Concerns identified during the preparation of past oil and gas development EISs in the region and associated Green River Basin Advisory Committee (GRBAC) meetings led the BLM RFO to request public input on the transportation needs and concerns for access to the CD/WIIPA and surrounding areas. Public scoping was initially conducted in June 1997. Additional input on transportation planning was requested in January 1998, scoping letters were issued, and potentially affected area users and management agencies were invited to attend a meeting on January 29, 1998. Those invited included Operators, county commissioners, state and county transportation departments, the Wyoming Game and Fish Department, recreation/conservation groups, landowners, and others commenting during scoping for the EIS. Additionally, drafts of the TP and the TPTSD were made available for review by the Wyoming Department of Transportation, Sweetwater and Carbon County Road and Bridge and Engineering Departments, Operators, key landowners, environmental groups, and individuals. A complete list of contacts can be obtained from the BLM RFO in Rawlins. Additional input from interested parties will be incorporated in annual operational updates to the TPTSD (see Section B-4.0).

All comments received during the scoping process for the Continental Divide/Wamsutter II project were considered in developing this TP and the TPTSD. Comments included the following.

Road Development

- Roads should not be overdesigned; build roads to minimum standards to deter use and reduce vehicle speeds
 - Do not fence roads
 - Roads with parallel drainages should be located outside the 100-year floodplain
 - Road standards should be consistent across checkerboard lands
 - Sources of funding to maintain BLM and county roads should be identified
 - Properly located loop roads can eliminate excessive use of some areas
 - Analyze alternative travel corridors and road standards
 - A transportation planning process that includes the state and counties, and cooperation between all interested parties is needed
 - County involvement is necessary in mainline road development and maintenance, and all roads should be built to county road design specifications
 - County needs to be involved at APD stage
 - Consider a "no net gain" policy for roads
 - Establish limits for road development and maintenance
 - Address private land access issues from new and existing roads and the problems associated with alternative road designs on private lands
 - Implementation of GRBAC transportation planning recommendations, and consideration of Wyoming Outdoor Council comments to GRBAC recommendations
 - Road development and transportation management impacts
 - Consistency of road development guidelines across BLM district boundaries and across checkerboard lands
 - Mineral ownership may affect Operator rights to construct roads on private lands
 - Landowners should be contacted prior to any new road construction so that their input and concerns can be addressed up front, and the BLM should not dictate road development activities on private lands
 - All roads as shown on Map B-1.2 should be kept for use as collector roads, and upgraded as necessary for proposed uses; additional collector roads will be needed as development progresses
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- When maximum road densities are met for the project, road building should cease until an equal amount of old roads are closed
- All stream crossings should be located in areas and constructed in ways that do not decrease channel stability or increase water velocity
- Road construction and reconstruction actions should be designed and conducted to minimize soil erosion
- Road construction costs and area of disturbance are increased when curves are planned for new roads to reduce visual impacts

Road Use

- Collector roads should be addressed individually in respect to paving or gravel surfacing to prevent mud from being carried on to existing highways
- Operators should enforce speed limits, and vehicle speeds should be reduced
- Use existing two-track roads to access well locations
- The use of looped roads should be minimized to avoid increased traffic
- Identify impacts from fugitive dust

Road Maintenance

- Immediately identify the proposed collector roads that currently need maintenance and action
- County roads should be maintained by the counties since they currently receive funds generated by the Operators; Operators should assist in eliminating problem areas on county roads
- Operators acquiring ROWs over BLM roads will need to enter into cooperative agreements with each other for road upgrades and maintenance
- Road maintenance actions require prioritization
- Appropriate maintenance of cattleguards, wing ditches, and culverts

Road Reclamation

- Closed roads should be obliterated, reclaimed, and signed as such to inform the public
- All roads developed for this project should be reclaimed when they are no longer required
- Reclaim 2 mi of road for every 1 mi constructed
- Roads are prolific in the project area and there is little attempt to decrease their impact to the Muddy Creek watershed and other resources
- Existing roads should be eliminated if another road accesses the same area, and Operators should look for opportunities to close and reclaim unused and redundant roads
- Two-track roads that are not used and which can be reclaimed should be identified
- Roads need to be reclaimed as soon as possible after abandonment
- The ultimate road situation (i.e., after the project is completed) should be similar to predevelopment (pre-1990)

Wildlife

- The proposed collector road along Delaney Rim may be a problem to existing raptor nesting habitat
 - Close coordination of the Wyoming Game and Fish Department, BLM, and Operators is needed for development in the Chain Lakes area
 - Minimize road densities and total miles of road to minimize impacts to wildlife populations
 - New roads increase access into areas which could increase the probability of wildlife poaching and
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- other forms of mortality (road kills)
- New roads cause habitat loss through direct conversion of habitat to road ROWs and increased wildlife disturbance (e.g., decreased use of habitats adjacent to roads, increased stress)
- Use locked gates, signs, and seasonal closures to reduce vehicle traffic thereby protecting wildlife by restricting access
- Field workers should visit wells during mid_day to minimize impacts to wildlife
- Impose speed limits to reduce big game road kills
- Impacts of roads on big game, especially antelope
- All perennial stream crossings should be adequately designed to allow fish passage at all flows
- Impacts to aquatic resources should be minimized to ensure compliance with Section 404 of the *Clean Water Act*
- Plow wildlife/livestock outlets through snow banks along roads in the winter season
- Habitat fragmentation from roads
- Due to extensive road development, requirements are needed to protect wildlife and other resource protection on BLM lands; duplicate roads are being built on private lands
- Avoid special features such as raptor nesting areas, sage grouse leks, crucial big game winter range, and associated buffers
- Impacts of new power lines on sage grouse predation, and avoid power line construction within 0.75 mi of sage grouse leks
- Identify mitigation measures (e.g., vehicular travel restrictions, existing road realignment) to prevent lek and ferruginous hawk nest abandonment
- Noise impacts to sage grouse and ferruginous hawks should be considered
- Pipeline development may improve winter wildlife habitat by removing decadent sagebrush
- Power line construction should be in accordance with raptor-safe criteria established by the Avian Power Line Interaction Committee

Interstate 80, Wyoming State Highways, and Other Developed Road Concerns

- No additional access off I-80 will be allowed
 - Height and width restrictions for I-80 underpasses and weight limits on all highways must be observed; fines will be issued for damage and noncompliance
 - A cross-over plan should be developed for the safe and proper use of median cross-overs
 - Space trucks requiring the use of cross-overs at least 5 minutes apart
 - Trucks should not pull onto or be backed_up on the left shoulder of I-80 prior to turning
 - Pull trucks onto emergency lanes prior to turning onto cross_over
 - Drive to a suitable interchange if cross-overs are not available
 - Operators may be liable for repair of cross-over roads
 - Cross-over use creates safety and liability problems, and cross-over use may be restricted
 - Safety and problem areas along I-80 need to be identified on TP maps
 - Approaches off existing highways and county roads will be limited to 2 or 3 per mi per side and will require cattleguards, paving, and adequate sight distance as appropriate for the classified road use
 - Additional approaches will be restricted
 - Operators are encouraged to use existing approaches
 - Turning lanes will be considered for high traffic_volume approaches
 - Mud on the highway is a safety concern. Surfacing of roads (up to 1 mi from the highway) may be necessary, but should not be mandated for all cases
 - Every highway approach is a conflict point, and permits will be required
 - Joint efforts should be made to upgrade (gravel surface) the Red Desert Road
 - Cattle guard damage is a problem
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- Overweight loads may damage cattleguards and bridges; construction of gated bypasses may be a solution
- Counties require notification prior to moving overweight loads
- Access to permanent facilities needs to be maintained for year-round use and facilities need to be accessible to emergency vehicles
- Most county roads are not all weather roads; therefore, surfacing is needed
- Access approaches will require permits and should be at 90E angles
- The term collector roads needs to be defined and a determination needs to be made if all existing county roads should be considered collector roads and if they need to be all weather roads
- Dust is a problem on existing county roads, and dust abatement measures will be required
- The Sweetwater County Road Department does not have adequate funds for road graveling and upgrading
- Carbon County Road 701 should be considered a collector road and may require gravel surfacing and dust abatement to maintain safety

Pipelines and Power Lines

- Maximize use of existing road and pipeline corridors
- Pipelines and power lines should parallel roads within the same ROW, and impacts should be identified
- Avoid development within existing power line ROWs
- Pipelines and power lines should be buried
- Build cuts along pipeline routes to discourage unauthorized travel along reclaimed ROWs
- Pipeline development may improve winter wildlife habitat by removing decadent sagebrush
- Power line construction should be in accordance with raptor-safe criteria established by the Avian Power Line Interaction Committee
- Pipeline densities could be less if paralleling every road was not the rule
- Pipelines and power lines cannot be constructed within and parallel to I-80 or state highway ROWs; pipeline and power line crossings of I-80 must be bored under the highway
- Identify any improvements to utility lines
- Crossing impacts must be mitigated by Operators
- No unreasonable restrictions on construction of utility and pipeline facilities

Recreation

- Use of roads by the public, public road designations, and public access
- Landowners should allow recreational use on their lands and avoid posting of lands
- Increased access will provide increased recreational opportunity
- Do not fence roads
- BLM signs should be removed to limit unauthorized public use of private roads and lands
- With reclamation, visual impacts are negligible for new roads

Other Concerns

- Operators need to do a better job monitoring damage to cattle guards, closing gates, and restricting unauthorized off-road travel along fencelines, two-track trails, and pipeline ROWs
 - Form a task force to develop a coordinated transportation plan to address access issues (county permits, private lands, drainage, safety, Uniform Fire Code compliance, traffic demands, county access), construction plans (e.g., permits, construction use, zone changes), and maintenance specifications (roads, cattleguards, bridges, heavy equipment)
 - Difficulties associated with problem-solving by large committees for transportation planning
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- The BLM has very few roads in the CD/WIIPA with easements across private and state lands
- The BLM issues ROWs for all its roads
- BLM roads are for use, development, protection, and administration of public lands and resources, and are not necessarily public roads; although public use is generally allowed, roads may be closed or use restricted to fulfill management objectives

B-3.0 EXISTING AND PROPOSED TRANSPORTATION NEEDS

B-3.1 THE EXISTING NETWORK

I-80 is the primary access to the entire CD/WIIPA. Other paved or partially paved roads include State Highway 789, U.S. Highway 287, a section of County Road 4-19, and County Road 4-63. The remainder of the roads are not paved and generally are not surfaced (e.g., gravel, aggregate). Some of these unpaved roads become impassable when wet and during winter, and if these roads are used as access for this project, they will require improvements and increased maintenance including snow removal. County roads (arterial roads) are maintained but in many cases there is no snow removal. County roads provide public access across private land; however, BLM roads or other roads which cross private lands may not have public ROWs. Nearly all of the existing county roads (proposed high-volume roads) within and adjacent to the CD/WIIPA originate at one of the exits of I-80, and most of these roads run north or south from I-80. Most of the routes that are not paved highways or county roads will require ROWs for access and will require improvement or reconstruction before project use. In addition, some realignment of these routes may occur to minimize impacts to sensitive resources, ensure safety, and maximize traffic flow efficiency. Map B-1.2, Maps 2.1 and 2.2 in the EIS, and the detailed maps available for review with the TPTSD show the existing and proposed locations of high-volume roads and/or corridors within the TPA (i.e., arterial roads and other potential collector and local road routes with high initial traffic volumes).

Additional local and resource roads (i.e., local roads = minimum traffic volume roads usually providing the internal access network within an oil and gas field; resource roads = normally spur roads providing point access to oil and gas well locations) are present on the CD/WIIPA, and additional access roads will be constructed as necessary and specified in annual operational updates to the TPTSD (see Chapter B-4.0). Where these new roads duplicate existing two-track roads/routes, the existing two-track may be reclaimed. At field abandonment, many newly constructed local and resource roads are anticipated to be reclaimed unless there is an identified need for the road by other area users. Reclamation activities will be addressed during annual planning and corresponding updates to the TPTSD.

The existing transportation network on the TPA is generally shown on Map B-1.2, and roads/routes are briefly described in the TPTSD (BLM 1999). This system includes state, county, and BLM access roads, most of which originate at I-80 and its exits. Historic use of the roads has been limited primarily to livestock operators, recreationists, and mineral developers. The principle current use of these and other roads in the area is for oil- and gas-related traffic; however, other users include grazing permittees and recreationists. The existing transportation system is generally suitable for all current users.

Undesignated two-track roads/routes also may be used to access the area. These routes are used primarily by grazing permittees and recreationists. Grazing permittees primarily use the two_tracks to access water developments and livestock.

Numerous pipeline routes deliver gas from the CD/WIIPA (see Map 2.2 in the EIS). Most lines parallel I-80; however, numerous gathering system lines are present. Further information regarding the location of pipelines on the CD/WIIPA can be found on the detailed maps available for review with the TPTSD at the BLM offices.

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B-3.2 PROPOSED NETWORK USE/MODIFICATION

The stages of a typical trip necessary for the CD/WIIPA transportation system are listed below.

- A. Main movement (i.e., I-80 and state highway lanes for workers with destinations terminating in the CD/WIIPA).
- B. Transition (i.e., exits, turnout lanes, where there is a change in travel speed).
- C. Distribution/collection (i.e., county, oil/gas field unit, or ranch access roads; collector and local roads).
- D. Terminal access (i.e., well location access roads; resource roads).

When planning transportation facilities, all of the described traffic stages can be identified within the system, but any stage could be eliminated if not needed (e.g., intermediate stages may not be necessary). Each movement stage is handled by a separate facility designed specifically for its function. Identifying the stages helps to plan traffic flows.

The TPA transportation network is not anticipated to experience problems at traffic stage changes, due to the relatively low volume of expected traffic (Table B-3.1). The distribution by distance of traffic stage changes within the CD/WIIPA also eliminates the probability of congestion when vehicles turn from collector or local roads to well access roads. The well access roads are dispersed far enough apart and the traffic volumes are low enough that traffic congestion will be unlikely. Although traffic volumes on CD/WIIPA roads generally will be low, heavy vehicles will use the roads throughout the LOP, and without road upgrades, some of these vehicles may become stuck during inclement weather periods, causing traffic flow problems. However, with the implementation of this plan, proper road construction and maintenance will occur, thereby minimizing the potential for this problem.

The estimated traffic requirements for each well are provided in Table B-3.1, and examples of potential traffic volumes on resource, local, and collector roads are provided in Table B-3.2. Construction, drilling, and completion activities have the greatest traffic requirements for the proposed project (an estimated 469 round trips per well over a 56-day period). These activities will most likely be concentrated within localized areas during the first 20 years as the project is developed. The maximum number of round trips per day is estimated to be approximately 1,000, and most trips will originate from I-80.

Localized construction and drilling activity will temporarily place heavy demands on road servicing. Traffic demands will be high in areas where drilling and completion activities are occurring, but will be minimal within other areas of the CD/WIIPA. Once all wells have been completed, traffic requirements will be minimal for the remainder of the LOP (i.e., averaging less than 150 project-required round trips per day for the entire area). Nonetheless, CD/WIIPA roads will be used throughout the LOP until all wells in the area are abandoned and disturbed areas reclaimed. Maintenance of roads remaining on the area after abandonment will be conducted by non-oil-and-gas entities.

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Table B-3.1 Vehicle Characteristics and Estimated Number of Trips Required for the Continental Divide/Wamsutter II Project, Sweetwater and Carbon Counties, 1999.

Truck Type	Average Weight (x 1,000 lbs)	No. of Wheels	Average Speed on the CD/WIIPA ¹ (mph)	Average Number of Round Trips per Location	Estimated Total Round Trips ² (x 1,000)
PROJECT DEVELOPMENT					
Location/Road Construction					
Semi	74	18	20	3	9
Gravel/haul	48	10	20	33	99
Pickup	7	4	30	47	141
Drilling Operations					
Semi	60	18	20	22	66
Fuel and mud	48	10	20	15	45
Logging and water	20	6	20	23	69
Pickup	7-8	4	30	133	399
Completion and Testing					
Semi	74-80	18	20	8	24
Haul A	48	10	20	33	99
Haul B	44	10	20	60	180
Haul C	20	6	20	21	63
Pickup	7-8	4	30	23	69
Pipeline Construction					
Haul B	44	10	20	4	12
Haul C	20	6	20	4	12
Pickup	7-8	4	30	40	120
Development Total	--	--	--	469	1,407
OPERATIONS ³					
Workover rig ⁴	90	18	20	3	9
Haul ⁵	48	10	20	425	312
Pickup ⁵	7-8	4	30	2,782	417
Operations Total	--	--	--	3,210	738

¹ Some vehicles may drive at speeds of 45 mph on maintained collector roads.

² Assumes 3,000 wells are drilled and completed as producers.

³ Assumes a well life of 30 years.

⁴ The workover rig vehicle will be the largest vehicle (i.e., critical vehicle) required for the project.

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⁵ Each well location will be visited twice a week on average, and approximately 15-20 well locations

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Table B-3.2 Example Traffic Volumes for Selected Resource, Local, and Collector Roads, Continental Divide/Wamsutter II Project, Sweetwater and Carbon Counties, 1999.

Road Type (No. of wells)	Estimated Number of Round Trips	Estimated Average Daily Traffic
Resource Road (1 well)	3,688	0.3
Resource Road (10 wells)	30,688	2.8
Local Road (50 wells)	184,400	16.8
Collector Road (100 wells)	306,880	28.0
Collector Road (500 wells)	1,884,000	168.4

B-3.3 ULTIMATE ROAD DISPOSITION

When the field is ready for abandonment (estimated to be approximately 50 years), the transportation network within the TPA will be reclaimed to specifications developed during the annual operational updates. Reclamation protocol are described in Appendix A of the EIS. Improvements to most existing roads likely will be maintained, and some roads identified as necessary or desirable for other area users (e.g., grazing permittees, recreationists) during annual operational updates will be retained.

Resource roads that may be retained after the LOP will be those identified during annual transportation planning as duplicating an existing two-track or other low-volume road/route for which these two-tracks or other roads/routes were reclaimed. In addition, resource roads that are deemed necessary by the BLM for other area uses also may be retained.

County roads likely will be retained in an upgraded status (local/collector road), as will improvements to BLM roads. All other local/collector roads potentially developed as access routes for this project are likely to be entirely reclaimed or returned to conditions similar to those occurring on the area prior to oil and gas development activities.

Road use following project completion likely will be limited to two of the three existing uses (i.e., grazing management and recreation), and responsibility for maintenance of roads will revert back to the counties, private landowners, or BLM. A determination regarding the extent of post-project road maintenance (e.g., winter snow removal) on the TPA cannot be determined at this time since the level of future area use is unknown. Decisions will be made during the later years of the project based on public input received during annual update reviews.

**B-4.0 ANNUAL PLANNING AND OPERATIONAL UPDATES
TO THE TRANSPORTATION PLANNING
TECHNICAL SUPPORT DOCUMENT**

To accommodate the uncertainty regarding proposed well locations and associated well productivity, future transportation routes within the CD/WIIPA and TPA (see Maps 2.1 and 2.2 in the EIS) will be developed incrementally as wells are developed and associated information on Operator transportation requirements becomes available. Annual operational updates to the TPTSD for the CD/WIIPA will begin in 1999, and annual updates will be available in January each year thereafter until the project is completed or until the transportation system is so well-established that further annual planning is not needed.

To facilitate the planning process, a Transportation Planning Committee (TPC) has been established. The TPC is composed of representative from the BLM, Operators, Sweetwater and Carbon County Transportation Departments, Wyoming Department of Transportation, Wyoming Game and Fish Department, landowners, grazing permittees, recreationists, and other interested groups or individuals. The committee will be responsible for overall transportation planning and for identifying and considering issues and concerns, whereas subcommittees/groups will likely be established for the resolution of site-specific issues (e.g., operational/compliance issues, individual road maintenance, and construction problems).

Annual transportation planning generally will be conducted to determine the location, maintenance, and design criteria for roads developed on the area. This process will involve annual Operator projections for well and ancillary facility developments, public input, and updates on sensitive resources. With this information, the TPC will assist in designing a road network that accommodates Operator and other area user needs, minimizes potential impacts to sensitive environmental resources, and maximizes traffic flow efficiencies commensurate with existing and potential needs.

The existing transportation network in the area is generally suitable for existing uses; however, as areas with natural gas resource potential are identified and developed, changes to the existing network will be required. Therefore, Operators will be required to provide to the TPC annual projections specifying proposed well and facility site locations and associated traffic requirements (e.g., estimated number of round trips; duration of construction, drilling, and completion activities; vehicle sizes). This information will be provided to the TPC by approximately mid-October of each year for the LOP, or until no longer required by the TPC (Table B-4.1). The TPC will evaluate this information, in light of environmental constraints and other known uses of the area, and develop tentative road, pipeline, and power line locations, types, and maintenance information. A draft update with maps will be developed by the TPC and submitted to area Operators and other relevant land users (e.g., grazing permittees, landowners, county and state transportation departments, recreationists) by approximately early November of each year. Meetings will then be held with the TPC and other interested land users to discuss modifications to the proposed update to accommodate Operator and other user concerns. Broad issues potentially affecting most area users will be discussed with the entire TPC, whereas site-specific operation, maintenance, or other specific road problems will be delegated for resolution to subcommittees. Public meetings will be held as deemed necessary by the TPC to present information and solicit additional comment. All issues associated with annual operational updates will be resolved during November and December of each year. A final update that considers all comments will be prepared and available for review in January of each year. Annual operational updates will be available for review at the BLM RFO and RSFO.

Geographic information system (GIS) technologies will be used to assist in the annual updating of the transportation network as appropriate. Maps will be updated to incorporate new sensitive resource locations,

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proposed roads, wells, pipelines, and ancillary facility locations. Existing roads designated for reclamation also will be identified. This process will result in minimizing the road densities on the area while accommodating all land user requirements.

Information that may be included in annual operational updates includes:

- the location of all existing wells, roads, pipelines, power lines, and other man-made features on the area;
- the location of all proposed wells, roads, pipelines, power lines, and other project-required features to be developed within the next year;
- the location of all roads to be reclaimed during the next year;
- the anticipated traffic volumes for all existing and proposed developments;
- identification of existing roads that require upgrades to accommodate existing and proposed traffic requirements (careful planning will be required to ensure roads will be neither under- nor over-designed);
- the identification of existing and required maintenance and associated maintenance, ROW, and cooperative agreements (including scheduling, responsible parties, and activities) for project-required roads;
- surfacing material source locations for road upgrades and maintenance;
- the location of sensitive resources (e.g., drainages, raptor nest and sage grouse lek buffers) and environmental obstacles (e.g., steep slopes, erosive soils) (The precise locations of some environmentally sensitive resources [e.g., cultural and paleontological resource sites] may not be presented in updates to avoid unauthorized use; however, the locations of these resources and associated buffers will be considered during the planning process.); and
- other identified transportation issues.

Final road location and design criteria for roads which either cross federal lands or are associated with federal wells will be included in Application for Permit to Drill (APD) and/or ROW applications and will be subject to independent environmental reviews and *National Environmental Policy Act* (NEPA) analysis by BLM. Some modification to proposed road locations specified in annual updates likely will occur as a result of these environmental analyses. For example, Class III cultural resource inventories will be required for all new roads, and these inventories may reveal the potential for significant cultural resource concerns in some areas. Roads will likely be rerouted to avoid such features. Once a road has been constructed, its final location will be identified on maps provided in the annual operational updates.

During the later years of the project (years 30-50), it is anticipated that annual updates primarily will identify well locations, ROWs, and other routes designated for abandonment and reclamation. The ultimate transportation network on the TPA is anticipated to appear much like the area appeared prior to natural gas development. However, public input received during the annual update process may recommend that some roads developed for the proposed project remain after the LOP. New roads that remain after the LOP will become the responsibility of BLM and/or private landowner. In addition, road upgrades of primary access routes will probably remain, and most resource roads developed for this project probably will be reclaimed unless they are determined necessary for other area uses as identified during annual planning.

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Table B-4.1 Annual Operational Update Responsibilities and Dates, Continental Divide/Wamsutter II Natural Gas Project, 1999.

Action	Responsibility	Approximate Submittal/ Completion Date
Provision of information regarding annual proposed well, road, and facility site locations with traffic requirements; wells and roads to be abandoned; major pipeline and power line projects; road upgrades; landowner concerns; and other issues	Operators, TPC, BLM, other interested parties	Mid-October
Development of agenda; evaluation of proposed plans; preparation of updated maps; and review of updates and other issues	TPC, BLM, Operators	Late October/ Early November
Public meetings to review development plans and associated issues	TPC, BLM, Operators, other interested parties	Early November
Resolution of issues by TPC	TPC, BLM, Operators, other interested parties	November/December
Final update completion/public meetings to discuss resolution measures	TPC, BLM, Operators, other interested parties	Early January

B-5.0 LITERATURE CITED

Bureau of Land Management. 1985. Bureau of Land Management manual Section 9113 roads.

_____.1991.Bureau of Land Management manual Section 9113 roads and Wyoming supplement.

_____.1995.Record of Decision for Union Pacific Resources Company, Greater Wamsutter Area II Natural Gas Development Project. Bureau of Land Management, Great Divide Resource Area, Rawlins District, Rawlins, Wyoming.

_____.1999.Transportation planning technical support document for the Continental Divide/Wamsutter II Natural Gas Project. Prepared for the U.S. Department of Interior, Bureau of Land Management, Rawlins District, Great Divide Resource Area, Rawlins, Wyoming, and Rock Springs District, Green River Resource Area, Rock Springs, Wyoming, by TRC Mariah Associates Inc., Laramie, Wyoming, and Uintah Engineering and Land Surveying, Vernal, Utah.

APPENDIX C:
HAZARDOUS MATERIALS SUMMARY

**HAZARDOUS MATERIALS SUMMARY FOR THE
CONTINENTAL DIVIDE/WAMSUTTER II
NATURAL GAS PROJECT**

Prepared for

**Bureau of Land Management
Great Divide Resource Area
Rawlins District
Rawlins, Wyoming**

and

**Green River Resource Area
Rock Springs District
Rock Springs, Wyoming**

By

**TRC Mariah Associates Inc.
Laramie, Wyoming
MAI Project 1295**

October 1998

C-1.0 INTRODUCTION

This Hazardous Materials Summary is provided pursuant to Bureau of Land Management (BLM) Instruction Memoranda Numbers WO-93-344 and WY-94-059, which require that all *National Environmental Policy Act* (NEPA) documents list and describe any hazardous and/or extremely hazardous materials that will be produced, used, stored, transported, or disposed of as a result of a proposed project. The summary serves as a supplement to the Continental Divide/Wamsutter II Natural Gas Project Environmental Impact Statement (BLM 1998).

Materials are considered hazardous if they contain chemicals or substances listed in the Environmental Protection Agency's (EPA's) *Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986*. Extremely hazardous materials are those identified in the EPA's *List of Extremely Hazardous Substances* (40 *Code of Federal Regulations* [C.F.R.] 355).

Hazardous materials anticipated to be used or produced during the project may come from drilling materials, casing and plugging materials, fracturing materials, production products, fuels, geophysical survey materials, pipeline materials, emissions, and miscellaneous materials. Where possible, the quantities of these products or materials have been estimated on a per-well basis. Hazardous and extremely hazardous constituents potentially occurring in these products or materials have been identified and are listed in Table C-1.1.

C-1.1 Hazardous and Extremely Hazardous Materials Potentially Utilized or Produced During Construction, Drilling, Production, and Reclamation Operations by the Continental Divide/Wamsutter II Natural Gas Project, Carbon and Sweetwater Counties, Wyoming, 1997.

C-1.1 DRILLING MATERIALS

Water-based drilling fluids consisting of clays and other additives will be utilized by drilling companies for drilling each well. Drilling fluid additives potentially containing hazardous materials are listed in Table C-1.1. The polyacrylamides used in drilling may contain the extremely hazardous substance acrylamide. Drilling fluids and additives will be appropriately transported to well locations during drilling operations. Drilling fluids, cuttings, and water will be stored in reserve pits located on-site, and reserve pits will be lined as directed by the BLM to conserve water and protect near-surface aquifers. When the reserve pit is no longer required, its contents will be evaporated or solidified in place, and the pit backfilled, as approved by the BLM.

C-1.2 CASING AND PLUGGING MATERIALS

Well completion and abandonment operations include cementing and plugging various segments of the well bore to protect freshwater aquifers and other down-hole resources. Wells will be cased and cemented as approved by the BLM (for federal minerals) and Wyoming Oil and Gas Conservation Commission (WOGCC) (for state and patented minerals). Cementing and plugging materials potentially containing hazardous materials are listed in Table C-1.1. The extremely hazardous material acrylamide may be present in fluid loss additives. All cementing and plugging materials will be transported in bulk to each well site. Small quantities may be transported and stored on-site in appropriate containers.

C-1.3 FRACTURING MATERIALS

Hydraulic fracturing is expected to be performed at all proposed wells to enhance gas flow rates. Fracturing fluids consist primarily of fresh water, but may contain some additives with hazardous constituents as shown in Table

C-1.1. Fracturing materials will be transported to well locations in bulk or in manufacturer's containers. Waste fracturing fluids will be collected in aboveground tanks and/or reserve pits and evaporated, or they will be hauled away from the location and reused at another well or disposed of at an authorized facility.

C-1.4 PRODUCTION PRODUCTS

C-1.4.1 Natural Gas

Natural gas produced from wells will primarily contain methane, ethane, and carbon dioxide. Hexane, polynuclear aromatic hydrocarbons (PAHs), and polycyclic organic matter (POM) are hazardous substances potentially present in the gas stream (Table C-1.1). No extremely hazardous materials are anticipated to be present. Small quantities of natural gas may be flared into a flare pit during well testing operations, pursuant to BLM/WOGCC rules and regulations (Notice to Lessees [NTL]-4A). BLM and WOGCC approval will be necessary prior to flaring operations. No natural gas will be stored on site.

C-1.4.2 Liquid Hydrocarbons

Condensates and/or oil produced in association with the gas stream are expected from productive wells. Hazardous materials potentially present in the liquid hydrocarbons are listed in Table C-1.1. No extremely hazardous materials are known to be present in the liquid hydrocarbons.

Liquid hydrocarbons will be stored in tanks at well locations, and all tanks will be fenced and bermed to contain 110% of the entire storage capacity of the largest tank. Liquid hydrocarbons periodically will be removed from storage tanks and transported by truck off the project area for sale to refineries. All necessary authorizing actions for the production, storage, and transport of liquid hydrocarbons, including the *Oil Pollution Act of 1990*, will be addressed prior to the initiation of production activities.

C-1.4.3 Produced Water/Drill Cuttings

Hazardous materials potentially present in trace amounts in produced water and drill cuttings are listed in Table C-1.1. No extremely hazardous materials are expected in the produced water or drill cuttings.

Produced water will be stored in tanks at well locations and periodically will be removed and transported to Wyoming Department of Environmental Quality (WDEQ)- or WOGCC-permitted water disposal facilities. Produced water quality from wells will be monitored periodically, and produced water that meets applicable standards will be discharged to the surface at appropriate locations. Necessary authorizing actions that must be met prior to the disposal of produced water include:

- BLM approval of disposal methodologies;
- *Resource Conservation and Recovery Act* (RCRA) compliance as necessary;
- WDEQ-Water Quality Division approval of wastewater disposal (e.g., National Pollution Discharge Elimination System permits, Underground Injection Control permits pursuant to 40 C.F.R. 144);
- WOGCC evaporation pond permits; and
- Wyoming State Engineer's Office (WSEO) dewatering permits (Form U.W.5).

Drill cuttings will be stored in reserve pits, and after evaporation, the pit will be backfilled as approved by the BLM.

Table 1.1 Hazardous and Extremely Hazardous Materials Potentially Utilized or Produced During Construction, Drilling, Production, and Reclamation Operations by the Continental Divide/Wamsutter II Natural Gas Project, Carbon and Sweetwater Counties, Wyoming, 1998.

Source	Approximate Quantities Used or Produced Per Well ¹	Hazardous Substances ²	Extremely Hazardous Substances ³	CAS No.
Drilling Materials				
Barite	16,000 lbs	Barium compounds Fine mineral fibers		-- --
Bentonite	45,000 lbs	Fine mineral fibers		--
Caustic soda	750 lbs	Sodium hydroxide		1310-73-2
Glutaraldehyde	20 gal	Isopropyl alcohol		67-63-0
Lime	3,500 lbs	Calcium hydroxide		1305-62-0
Mica	600 lbs	Fine mineral fibers		--
Modified tannin	250 lbs	Ferrous sulfate Fine mineral fibers		7720-78-7 --
Phosphate esters	100 gal	Methanol		67-56-1
Polyacrylamides	100 gal		Acrylamide	79-06-1
		PAHs ⁴ Petroleum distillates POM ⁵		-- 64742-47-8 --
Retarder	400 lbs	Fine mineral fibers		--
Cementing and Plugging Materials				
Anti-foamer	100 lbs	Glycol ethers		--
Calcium chloride flake	2,500 lbs	Fine mineral fibers		--
Cellophane flake	300 lbs	Fine mineral fibers		--
Cements	77,000 lbs	Aluminum oxide Fine mineral fibers		1344-28-1 --
Chemical wash	850 gal	Ammonium hydroxide Glycol ethers		1336-21-6 --
Diatomaceous earth	1,000 lbs	Fine mineral fibers		--
Extenders	17,500 lbs	Aluminum oxide Fine mineral fibers		1344-28-1 --
Fluid loss additive	900 lbs		Acrylamide	79-06-1
		Fine mineral fibers Napthalene		-- 91-20-3
Friction reducer	160 lbs	Fine mineral fibers Napthalene PAHs POM		-- 91-20-3 -- --
Mud flash	250 lbs	Fine mineral fibers		--
Retarder	100 lbs	Fine mineral fibers		--
Salt	2,570 lbs	Fine mineral fibers		--
Silica flour	4,800 lbs	Fine mineral fibers		--
-- Fracturing Materials				
Biocides	6 gal	Fine mineral fibers PAHs POM		-- -- --
Breakers	145 lbs	Ammonium persulphate Ammonium sulphate Copper compounds Ethylene glycol Fine mineral fibers Glycol ethers		7727-54-0 7783-20-2 -- 107-21-1 -- --

Clay stabilizer	50 gal	Fine mineral fibers	--
		Glycol ethers	--
		Isopropyl alcohol	67-63-0
		Methanol	67-56-1
		PAHs	--
		POM	--
Crosslinkers	60 gal	Ammonium chloride	12125-02-9
		Methanol	67-56-1
		Potassium hydroxide	1310-58-3
		Zirconium nitrate	13746-89-9
		Zirconium sulfate	14644-61-2
Foaming agent	120 gal	Glycol ethers	--
Gelling agent	950 gal	Benzene	71-43-2
		Ethylbenzene	100-41-4
		Methyl tert-butyl ether	1634-04-4
		Naphthalene	91-20-3
		PAHs	--
		POM	--
		Sodium hydroxide	1310-73-2
		Toluene	108-88-3
		m-Xylene	108-38-3
		o-Xylene	95-47-6
		p-Xylene	106-42-3
pH buffers	60 gal	Acetic acid	64-19-7
		Benzoic acid	65-85-0
		Fumaric acid	110-17-8
		Hydrochloric acid	7647-01-0
		Sodium hydroxide	1310-73-2
Sands	2,000,000 lbs	Fine mineral fibers	--
Solvents	50 gal	Glycol ethers	--
Surfactants	15 gal	Glycol ethers	--
		Isopropyl alcohol	67-63-0
		Methanol	67-56-1
		PAHs	--
		POM	--
		-- Production Products	
Natural gas	0.25->3.5 mmcf/d	n-Hexane	110-54-3
		PAHs	--
		POM	--
Liquid hydrocarbons	<5-350 bpd	Benzene	71-43-2
		Ethyl benzene	100-41-4
		n-Hexane	110-54-3
		PAHs	--
		POM	--
		Toluene	108-88-3
		m-Xylene	108-38-3
		o-Xylene	95-47-6
		p-Xylene	106-42-3
Produced water/drill cuttings	<20 bpd water and an unknown quantity of cuttings	Barium	7440-39-3
		Cadmium	7440-43-9
		Chromium	7440-47-3
		Lead	7439-92-1
		Manganese	7439-96-5
		Radium 226	--
		Uranium	--
		Other radionuclides	--
Fuels			
Diesel fuel	>36,300 gal	Benzene	71-43-2
		Cumene	98-82-8
		Ethylbenzene	100-41-4
		Methyl tert-butyl ether	1634-04-4
		Naphthalene	91-20-3
		PAHs	--
		POM	--
		Toluene	108-88-3
		m-Xylene	108-38-3
		o-Xylene	95-47-6
		p-Xylene	106-42-3

Gasoline	Unk	Benzene	71-43-2
		Cumene	98-82-8
		Cyclohexane	110-82-7
		Ethylbenzene	100-41-4
		n-Hexane	110-54-3
		Methyl tert-butyl ether	1634-04-4
		Naphthalene	91-20-3
		PAHs	--
		POM	--
		Tetraethyl lead	78-00-2
		Toluene	108-88-3
		m-Xylene	108-38-3
		o-Xylene	95-47-6
		p-Xylene	106-42-3
Jet A	Unk	Benzene	71-43-2
		Cumene	98-82-8
		Cyclohexane	110-82-7
		Ethylbenzene	100-41-4
		n-Hexane	110-54-3
		Methyl tert-butyl ether	1634-04-4
		Naphthalene	91-20-3
		PAHs	--
		POM	--
		Toluene	108-88-3
		m-Xylene	108-38-3
		o-Xylene	95-47-6
		p-Xylene	106-42-3
Natural gas	Unk	n-Hexane	110-54-3
		PAHs	--
		POM	--
Propane	Unk	Propylene	115-07-1
Geophysical Survey Materials			
Explosives, fuses, detonators, boosters, fuels	Unk	Aluminum	7429-90-5
		Ammonium nitrate	6484-52-2
		Benzene	71-43-2
		Cumene	98-82-8
		Ethylbenzene	100-41-4
		Ethylene glycol	107-21-1
		Lead compounds	7439-92-1
		Methyl tert-butyl ether	1634-04-4
		Naphthalene	91-20-3
		Nitric acid	7697-37-2
		Nitroglycerine	55-63-0
		PAHs	--
		POM	--
		Toluene	108-88-3
		m-Xylene	108-38-3
		o-Xylene	95-47-6
		p-Xylene	106-42-3
Pipeline Materials			
Coating	Unk	Aluminum oxide	1334-28-1
Cupric sulfate solution	Unk	Cupric sulfate	7758-98-7
		Sulfuric acid	7664-93-9
Diethanolamine	Unk	Diethanolamine	111-42-2
LP Gas	Unk	Benzene	71-43-2
		n-Hexane	110-54-3
		Propylene	115-07-1
Molecular sieves	Unk	Aluminum oxide	1344-28-1
Pipeline primer	Unk	Naphthalene	91-20-3
		Toluene	108-88-3
Potassium hydroxide solution	Unk	Potassium hydroxide	1310-58-3
Rubber resin coatings	Unk	Acetone	67-64-1
		Coal tar pitch	68187-57-5
		Ethyl acetate	141-78-6
		Methyl ethyl ketone	78-93-3
		Toluene	108-88-3
		Xylene	1330-20-7Emissions

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Gases	127 tons ⁶	Formaldehyde	50-00-0
		Nitrogen dioxide	10102-44-0
		Ozone	10028-15-6
		Sulfur dioxide	7446-09-5
		Sulfur trioxide	7446-11-9
Hydrocarbons	492 tons ⁷	Benzene	71-43-2
		Ethylbenzene	100-41-4
		n-Hexane	100-54-3
		PAHs	--
		Toluene	108-88-3
		m-Xylene	108-38-3
		o-Xylene	95-47-6
		p-Xylene	106-42-3
Particulate matter	24 tons ⁸	Barium	7440-39-3
		Cadmium	7440-43-9
		Copper	7440-50-8
		Fine mineral fibers	--
		Lead	7439-92-1
		Manganese	7439-96-5
		Nickel	7440-02-0
		POM	--
		Zinc	7440-66-6
Miscellaneous Materials			
Acids	Unk	Acetic anhydride	108-24-7
		Formic acid	64-18-6
		Sodium chromate	777-11-3
		Sulfuric acid	7664-93-9
Antifreeze, heat control, and dehydration agents	300 gal	Acrolein	107-02-8
		Cupric sulfate	7758-38-7
		Ethylene glycol	107-21-1
		Freon	76-13-1
		Phosphoric acid	766-38-2
		Potassium hydroxide	1310-58-3
		Sodium hydroxide	1310-73-2
		Triethylene glycol	112-27-6
Batteries	Unk	Cadmium	7440-43-9
		Cadmium oxide	1306-19-0
		Lead	7439-92-1
		Nickel hydroxide	7440-02-0
		Potassium hydroxide	1310-58-3
		Sulfuric acid	7664-93-9
Biocides	Unk	Formaldehyde	50-00-0
		Isopropyl alcohol	67-63-0
		Methanol	67-56-1
Cleaners	Unk	Hydrochloric acid	7647-01-0
Corrosion inhibitors	Unk	4-4' methylene dianiline	101-77-9
		Acetic acid	64-19-7
		Ammonium bisulfite	10192-30-0
		Basic zinc carbonate	3486-35-9
		Diethylamine	109-89-7
		Dodecylbenzenesulfonic acid	27176-87-0
		Ethylene glycol	107-21-1
		Isobutyl alcohol	78-83-1
		Isopropyl alcohol	67-63-0
		Methanol	67-56-1
		Napthalene	91-20-3
		Sodium nitrite	7632-00-0
		Toluene	108-88-3
		Xylene	1330-20-7
Emulsion breakers	Unk	Acetic acid	64-19-7
		Acetone	67-64-1
		Ammonium chloride	12125-02-9
		Benzoic acid	65-85-0
		Isopropyl alcohol	67-63-0
		Methanol	67-56-1
		Napthalene	91-20-3
		Toluene	108-88-3
		Xylene	1330-20-7
		Zinc chloride	7646-85-7

Fertilizers	Unk	Unk	--
Herbicides	Unk	Unk	--
Lead-free thread compound	25 gal	Copper	7440-50-8
		Zinc	7440-66-6
Lubricants	Unk	1,2,4-trimethylbenzene	95-63-6
		Barium	7440-39-3
		Cadmium	7440-43-9
		Copper	7440-50-8
		n-Hexane	110-54-3
		Lead	7439-92-1
		Manganese	7439-96-5
		Nickel	7440-02-0
		PAHs	--
		POM	--
		Zinc	7440-66-6
Methanol	200 gal	Methanol	67-56-1
Motor oil	220 gal	Zinc compounds	--
Paints	Unk	Aluminum	7429-90-5
		Barium	7440-39-3
		n-Butyl alcohol	71-36-3
		Cobalt	7440-48-4
		Lead	7439-92-1
		Manganese	7439-96-5
		PAHs	--
		POM	--
		Sulfuric acid	7664-93-9
		Toluene	108-88-3
		Triethylamine	121-44-8
		Xylene	1330-20-7
		Paraffin control	Unk
		Carbon disulfide	Unk
		Ethylbenzene	100-41-4
		Methanol	67-56-1
		Toluene	108-88-3
		Xylene	1330-20-7
Photoreceptors	Unk	Selenium	7782-49-2
Scale inhibitors	Unk	Acetic acid	64-19-7
		Ethylene diamine	60-00-4
		Ethylene glycol	107-21-1
		Formaldehyde	50-00-0
		Hydrochloric acid	7647-01-0
		Isopropyl alcohol	67-63-1
		Methanol	67-56-1
		Nitritotriacetic acid	139-13-9
Sealants	Unk	1,1,1-trichloroethane	71-55-6
		n-Hexane	110-54-3
		PAHs	--
		POM	--
Solvents	Unk	1,1,1-trichloroethane	71-55-6
		Acetone	67-64-1
		t-Butyl alcohol	75-65-0
		Carbontetrachloride	56-23-5
		Isopropyl alcohol	67-63-0
		Methyl ethyl ketone	108-10-1
		Methanol	67-56-1
		PAHs	--
		POM	--
		Toluene	108-88-3
		Xylene	1330-20-7
Starting fluid	Unk	Ethyl ether	60-29-7
Surfactants	Unk	Ethylene diamine	107-15-3
		Isopropyl alcohol	67-56-1
		Petroleum naphtha	8030-30-6

¹ lbs = pounds; gal = gallons; mmcf = million cubic feet per day; bpd = barrels per day; Unk = unknown quantities to be listed based on information availability.

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- ² Hazardous substances are those constituents listed under the *Consolidated List of Chemicals Subject to Reporting Under Title III of SARA 1986*, as amended.
³ Extremely hazardous substances are those defined in 40 CFR 355.
⁴ PAHs = polynuclear aromatic hydrocarbons.
⁵ POM = polycyclic organic matter.
⁶ Value includes nitrogen oxides (NO_x) (107 tons per well) and sulfur dioxide (SO₂) (20 tons per well) emission estimates only, as adapted from BLM (1996).
⁷ Value includes volatile organic compound (VOC) emission estimates only, as adapted from BLM (1996).
⁸ Value includes particulate matter less than 10 microns diameter (PM₁₀) emission estimates only, as adapted from BLM (1996).
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C-1.5 FUELS

Diesel fuel, gasoline, Jet A Fuel, natural gas, and propane will be used for the project. All contain hazardous materials (Table C-1.1). Gasoline and diesel will be used by vehicles providing transport to and from the project area. Diesel, gasoline, and Jet A fuel will be used for geophysical survey operations. Diesel fuel will also be used in drilling operations and construction equipment, and as a minor component of fracturing fluids. Natural gas produced by the proposed project will be used to power pipeline compressor stations and other ancillary facilities. Propane will be utilized for miscellaneous heating purposes.

C-1.5.1 Diesel Fuel

Diesel fuel for use as a fuel will be used as described for gasoline. Each well location will have aboveground storage tanks containing diesel fuel during drilling operations. Tanks will be filled by a local fuel supplier. The use, transport, and storage of diesel fuel will be conducted in accordance with all relevant state and/or federal rules, regulations, and guidelines.

C-1.5.2 Gasoline

Gasoline is known to contain hazardous materials (Table C-1.1). Gasoline will be purchased from regional vendors and primarily will be stored and transported in vehicle gas tanks. Some additional gasoline storage may be provided in appropriately designed and labeled 1- to 5-gal containers for supplemental use as vehicle fuel. No large_scale storage of gasoline is anticipated. Tetraethyl lead, an extremely hazardous material, is present in leaded gasoline (regular).

C-1.5.3 Jet A Fuel

Jet A fuel is known to contain hazardous materials (Table C-1.1). Jet A fuel will be purchased from regional vendors and primarily will be stored and transported in vehicle tanks. Some additional storage may be provided in appropriately designed and labeled containers for supplemental use as fuel. No large_scale storage of Jet A fuel is anticipated.

C-1.5.4 Natural Gas

Natural gas produced on-site will be burned to provide power for compressor stations and other ancillary facilities. Hazardous materials are known to be present in natural gas (Table C-1.1). No extremely hazardous materials are known to exist in the natural gas from the project area.

C-1.5.5 Propane

The only hazardous material known to be present in propane is propylene (Table C-1.1). No extremely hazardous materials are known to be present. Propane will be purchased from regional vendors and will be stored and transported in appropriate propane tanks. No large-scale storage of propane is anticipated.

C-1.6 GEOPHYSICAL SURVEY MATERIALS

Geophysical survey operations, which are subject to separate environmental analyses for purposes of NEPA compliance, may be conducted on portions of the project area. Materials utilized for geophysical surveys that potentially contain hazardous materials are listed in Table C-1.1. Hazardous materials potentially contained in these products will be handled according to applicable state and federal regulations.

C-1.7 PIPELINE MATERIALS

Gas produced from wells will be transported from each location through pipelines linking well locations to existing natural gas gathering systems. Industry standard pipeline equipment, materials, techniques, and procedures in conformance with all applicable regulatory requirements will be employed during construction, testing, operation, and maintenance of the project to ensure pipeline safety and efficiency. All necessary authorizing actions for natural gas pipelines will be addressed prior to installation. These actions include:

- Carbon and Sweetwater Counties special use permits;
- BLM rights-of-way (ROWs) applications;
- conformance with Department of Transportation pipeline regulations (49C.F.R.191-192); and
- Wyoming Public Service Commission Certificates to act as common carrier for natural gas.

Materials utilized for pipeline construction, operation, and maintenance that may contain hazardous materials are listed in Table C-1.1. Hazardous materials associated with pipeline construction, operation, and maintenance will be handled in accordance with applicable state and federal regulations.

C-1.8 EMISSIONS

Emissions from combustion engines; well construction, completion, and production; and pipeline construction, operation, and maintenance will occur as a result of this project. Hazardous and extremely hazardous materials are known to be released directly or formed secondarily (i.e., ozone) from the construction and operation of natural gas wells and associated pipelines (Table C-1.1). Extremely hazardous emissions include nitrogen dioxide, sulfur dioxide, sulfur trioxide, and ozone (formed secondarily). No releases of these hazardous or extremely hazardous materials are anticipated to exceed quantities allowed for in Prevention of Significant Deterioration Class II areas of the WDEQ-Air Quality Division Implementation Plan, nor are combustion emissions expected to exceed Wyoming Ambient Air Quality Standards or National Ambient Air Quality Standards. Particulate matter emissions and larger unburned hydrocarbons will eventually settle out on the ground surface, whereas gaseous emissions will react with other air constituents as components of the nitrogen, sulfur, and carbon cycles.

C-1.9 MISCELLANEOUS MATERIALS

Miscellaneous materials potentially containing hazardous substances that may be used for the proposed project are listed in Table C-1.1. Quantities of these miscellaneous hazardous materials are unknown; however, no extremely hazardous substances are known to be present in any of these materials. Miscellaneous materials will be used during well construction and production operations; well, pipeline, and equipment maintenance; and reclamation activities.

C-2.0 MANAGEMENT POLICY AND PROCEDURE

Each individual Operator will be responsible for ensuring that all production, use, storage, transport, and disposal of hazardous and extremely hazardous materials as a result of the proposed project will be in accordance with all applicable existing or hereafter promulgated federal, state, and local government rules, regulations, and guidelines. All project-related activities involving the production, use, and/or disposal of hazardous or extremely hazardous materials will be conducted to minimize potential environmental impacts.

Each Operator will comply with emergency reporting requirements for releases of hazardous materials. Any release of hazardous or extremely hazardous substances in excess of the reportable quantity, as established in 40 C.F.R. 117, must legally be reported as required by the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA), as amended (42 U.S.C. 9601 *et seq.*). The materials for which such notification must be given are the extremely hazardous substances listed under the *Emergency Planning and Community Right to Know Act*, Section 302, and the hazardous substances designated under Section 102 of CERCLA, as amended. If a reportable quantity of a hazardous or extremely hazardous substance is released, immediate notice must be given to the BLM's Authorized Officer and all other appropriate federal and state agencies. Additionally, the Operator immediately will give notice of any spill or leakage, as defined in BLM NTL-3A, to the Authorized Officer and other such federal and state officials as required by law. Incidents requiring verbal notification by regulation will be given as soon as possible, but no later than 24 hours after discovery of the incident. Verbal notification will be confirmed in writing within 15 days or other such time required by the appropriate regulatory agency.

Each Operator will prepare and implement, as necessary, the following plans and/or policies:

- pursuant to 40 C.F.R. 112, Spill Prevention Control and Countermeasure Plans (SPCCPs) for those sites where SPCCPs are applicable;
- Spill Response Plans (oil/condensate);
- plans and inventories of hazardous chemical categories pursuant to Section 312 of SARA, as amended; and
- Emergency Response Plans.

Copies of the above will be maintained with the Operators, as required by regulation, and will be made available upon request.

Development operations are also required to be in compliance with regulations promulgated under the *Resource Conservation and Recovery Act*, *Federal Water Pollution Control Act* (Clean Water Act), *Safe Drinking Water Act*, *Toxic Substances Control Act*, *Occupational Safety and Health Act*, and the *Federal Clean Air Act*. In addition, project operations must comply with all attendant state rules and regulations relating to hazardous material reporting, transportation, management, and disposal.

C-3.0 LITERATURE CITED/ABBREVIATIONS AND ACRONYMS

C-3.1 LITERATURE CITED

- Bureau of Land Management. 1996. Moxa Arch and Fontelle EISs Air Quality Technical Support Document. Cumulative Impact Analysis of Southwestern Wyoming Natural Gas Development Projects on Air Quality. Bureau of Land Management, Kemmerer and Green River Resource Areas, Rock Springs District, Rock Springs, Wyoming.
- _____. 1998. Draft Environmental Impact Statement. Continental Divide/Wamsutter II Natural Gas Project. Bureau of Land Management Great Divide Resource Area, Rawlins District, Rawlins, Wyoming, and Green River Resource Area, Rock Springs District, Rock Springs, Wyoming.

C-3.2 ABBREVIATIONS AND ACRONYMS

bpd	barrels per day
BLM	Bureau of Land Management
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act</i>
C.F.R.	<i>Code of Federal Regulations</i>
EPA	Environmental Protection Agency
gal	gallon(s)
lbs	pounds
mmcf/d	million cubic feet per day
NEPA	<i>National Environmental Policy Act</i>
NO _x	nitrogen oxides
NTL	Notice to Lessees
PAHs	polycyclic aromatic hydrocarbons
PM ₁₀	particulate matter less than 10 microns diameter
POM	polycyclic organic matter
RCRA	<i>Resource Conservation and Recovery Act</i>
ROWS	rights-of-way
SPCCPs	Spill Prevention Control and Countermeasure Plans
SARA	<i>Superfund Amendments and Reauthorization Act</i>
SO ₂	sulfur dioxide
Unk	unknown quantities to be listed based on information availability
VOC	volatile organic compound
WDEQ	Wyoming Department of Environmental Quality
WOGCC	Wyoming Oil and Gas Conservation Commission
WSEO	Wyoming State Engineer's Office

APPENDIX D:
WILDLIFE PROTECTION PLAN

Modifications to this plan have been made pursuant to the U.S. Fish and Wildlife Service Biological Opinion and associated implementation protocol (Appendix G) and including Wyoming Bureau of Land Management Instruction Memorandum No. WY-2000-44 (Appendix I).

**WILDLIFE PROTECTION PLAN,
CONTINENTAL DIVIDE/WAMSUTTER II EIS**

Prepared for

**U.S. Bureau of Land Management
Rawlins Field Office
Rawlins, Wyoming**

and

**Rock Springs Field Office
Rock Springs, Wyoming**

By

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April 1999

ABBREVIATIONS AND ACRONYMS

ANS	Artificial nesting structures
APD	Application for Permit to Drill
APLIC	Avian Powerline Interaction Committee
BLM	Bureau of Land Management
CD/WIIPA	Continental Divide/Wamsutter II Project Area
CSU	Controlled Surface Use
EIS	Environmental impact statement
ft	Foot (feet)
GIS	Geographic Information System
LOP	Life_of_project
mi	Mile(s)
ROW	Right_of_way
SRA	Sensitive resource area
TEC&SC	Threatened, endangered, candidate and other species of concern
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WDEQ-LQD	Wyoming Department of Environmental Quality, Land Quality Division
WGFD	Wyoming Game and Fish Department
WNDDDB	Wyoming Natural Diversity Database

D-1.0 INTRODUCTION

This wildlife monitoring/protection plan was prepared in conjunction with the environmental impact statement (EIS) for the Continental Divide/Wamsutter II Natural Gas Project, Sweetwater and Carbon Counties, Wyoming. The goal of the plan is to avoid and/or minimize adverse impacts to wildlife present on project-affected areas by monitoring wildlife population trends on the Continental Divide/Wamsutter II Project Area (CD/WIIPA) during the course of project development and operations and by developing appropriate mitigative actions. MapD_1.1 shows the location of the CD/WIIPA and associated wildlife monitoring areas. Implementation of the plan will allow land managers and project personnel opportunities to achieve and maintain desired levels of wildlife productivity and populations on the CD/WIIPA (e.g., at pre-project levels) by minimizing and/or avoiding potential adverse impacts to wildlife species. In addition, the implementation of this plan will facilitate the maintenance of a diverse assemblage of wildlife populations on the CD/WIIPA simultaneously with the development of natural gas reserves.

The proposed Continental Divide/Wamsutter II Natural Gas Project involves the development of a maximum of 3,000 new well locations and associated facilities (roads, pipelines, compressor stations) on the CD/WIIPA over the next 20 years. The proposed life-of-project (LOP) is estimated to be from 30 to 50 years. Alternative development strategies also have been proposed (i.e., Proposed Action, 14-acre maximum surface disturbance per federally managed section in sensitive resource areas [SRAs], 30-acre maximum surface disturbance per federally managed section in SRAs, No Action). A complete description of the proposed project and alternatives is provided in Chapter 2.0 of the EIS.

Proposed inventory, monitoring, and protection measures will be implemented under each potential development scenario (i.e., alternative), unless information revealed in the coordinated review of annual wildlife reports (see SectionD_2.1.1) indicates these measures are unnecessary for wildlife protection. This wildlife plan will not be implemented under the No Action Alternative.

Implementation of the plan will begin in 1999, and it is estimated that implementation will continue for a maximum of 21 years; however, the plan may be terminated at the end of any year when there is sufficient evidence that wildlife populations and productivity in the CD/WIIPA have been successfully protected. The plan will receive a major review for effectiveness every 5 to 6 years (i.e., years 6, 11, 16, and 21 during implementation).

D-2.0 IMPLEMENTATION PROTOCOL

This section provides preliminary wildlife inventory, monitoring, and protection protocol. A summary of primary protocol components is provided in TableD_2.1. Additional inventory, monitoring, and protection measures are provided for areas of intense development in TableD_2.2. Standard protocol for Application for Permit to Drill (APD) and right_of_way (ROW) application field reviews are provided in TableD_2.3. Alternative protocols likely will be developed in the future in response to specific needs identified in annual wildlife reports (see Section D-2.1.1). Methods are provided for each wildlife species/category, and additional species/categories may be added based on needs identified in annual wildlife reports. The wildlife species/categories for which specific inventory, monitoring, and protection procedures will be applied were developed based on management agency (i.e., Bureau of Land Management [BLM], U.S. Fish and Wildlife Service [USFWS], Wyoming Game and Fish Department [WGFD]) and individual concerns identified during the preparation of the EIS (see EIS Section 1.4).

While considerable efforts will be required by agency and Operator (e.g., Amoco Production Company, Union Pacific Resources Company, Snyder Oil Corporation, etc.) personnel for plan implementation; it is anticipated that with the newly identified assistance provided by the Operators, this plan could be executed without considerable additional agency commitment. Many of the annually proposed agency data collection activities are consistent with current agency activities. Additionally, during annual planning (see SectionD-2.1) and throughout project implementation, all efforts will be made to accommodate agency personnel schedules and responsibilities, and further agency cost_sharing approaches will be considered such that public demands and statutory directives are achieved.

D-2.1 ANNUAL REPORTS AND MEETINGS

D-2.1.1 Reports

During project development (i.e., 15 to 20 years), Operators will provide an annual inventory and description of all existing project features (i.e., location, size, and associated level of human activity at each feature), as well as those tentatively proposed for development during the next 12 months. This inventory will be submitted to the BLM by Operators no later than October 15 of each calendar year. These data will be coupled with annual wildlife inventory, monitoring, and protection data obtained for the previous year and included in annual reports. Annual reports will be prepared by the BLM. When annual wildlife inventory, monitoring, and protection data are gathered by parties other than the BLM, those parties (e.g., Operators, WGFD) will be requested to provide the

data to the BLM by October 15 of each calendar year. Upon receipt of these data, annual reports will be completed in draft form by the BLM and submitted to the Operators, USFWS, and other interested parties no later than November 15 of each year. A 1-day meeting of the aforementioned parties will be organized by the BLM and held in early December of each year to discuss and modify, as necessary, proposed wildlife inventory, monitoring, and protection protocol for the subsequent year.

Decisions regarding annual Operator-specific financing and personnel requirements will be made at these meetings, and it is anticipated that a formula for determining these requirements will be developed at the first year's meeting. In addition, a protocol regarding how to accommodate previously unidentified development sites will also be determined during the first year's meeting. Final decisions will be made by the BLM based on the input of all affected parties.

A final annual report will be issued by the BLM to all potentially affected individuals and groups by early February of each year. The first annual report will be submitted by February 15, 2001.

Annual reports will summarize annual wildlife inventory and monitoring results, note any trends across years, identify and assess protection measures implemented during past years, specify monitoring and protection measures proposed for the upcoming year, and recommend modifications to the existing wildlife monitoring/protection plan based on the successes and/or failures of past years (e.g., identification of additional species/categories to be monitored). Where possible, the data presented in reports will be used to identify potential correlations between development and wildlife productivity and/or abundance. Addendum D-A provides examples for the tabular presentation of data within annual reports. The BLM's Geographic Information System

Table D-2.1 Summary of General Wildlife Reporting, Inventory, and Monitoring, Continental Divide/WamsutterII Natural Gas Project, Sweetwater and Carbon Counties, Wyoming, 1999.

Action	Dates	Responsible Entity ¹
Annual area-wide tentative plan of development showing locations of existing and newly proposed development features	Annually by October 15	Operators
Annual reports summarizing findings and presenting protection actions	Annually by: Draft - early November Final - early January	BLM with reviews by Operators, USFWS, and other interested parties
Meetings to finalize future year's inventory, monitoring, and protection measures	Early December and as necessary	BLM with participation by USFWS, Operators, and other interested parties
Inventory and Monitoring		
Raptor nest inventories (CD/WIIPA plus 1_mi buffer) (excluding burrowing owls)	Every 5 years during April_May	BLM with Operator_provided financial assistance for aircraft rental
Raptor productivity monitoring (at active nests within 1-mi of project-required disturbance areas on the CD/WIIPA plus 1-mi buffer)	Every 5 years during March to mid_July	BLM with Operator-provided financial assistance for aircraft rental, as necessary
Aerial sage grouse lek inventories (CD/WIIPA plus 2_mi buffer)	Every 5 years during March_April	BLM surveyor with Operator_provided financial assistance for aircraft rental
Sage grouse lek attendance monitoring on and within 2mi of the CD/WIIPA	Annually during March _ mid_May	Selected leks will be visited at least once by the BLM, such that all known leks are visited every 3years
Big game crucial winter range use monitoring (crucial winter range on the CD/WIIPA plus a 1-mi buffer)	As available	BLM will request available data from the WGFD

¹ With Operator assistance, it is anticipated that agency obligations will not greatly exceed currently approved personnel or financial commitments.

Table D-2.2 Additional Wildlife Inventory and Monitoring Measures On and Adjacent to Areas with High Levels of Development (\$4 Locations/Section), Continental Divide/Wamsutter II Natural Gas Project, Sweetwater and Carbon Counties, Wyoming, 1999.

Action	Dates	Responsible Entity ¹
Raptor nest inventory/monitoring on areas with \$4 locations/section plus a 1_mi buffer and selected undeveloped comparison areas	Annually during April and May	BLM surveyor with Operator_provided financial assistance for aircraft rental
Raptor productivity monitoring on areas with \$4 locations/section plus a 1_mi buffer and selected undeveloped comparison areas	Annually during March-July	BLM surveyor with Operator_provided financial assistance for BLM volunteer support
Selected TEC&SC inventory/monitoring on suitable habitats in areas with \$4 locations/section plus a 1_mi buffer and selected undeveloped comparison areas	Annually during spring and summer	Operator-financed BLM-approved biologist
Aerial sage grouse lek inventory on areas with \$4locations/section plus a 2-mi buffer and selected undeveloped comparison areas	Annually during March-April	BLM surveyor with Operator_provided financial assistance for aircraft rental
Sage grouse lek attendance monitoring on areas with \$4 locations/section plus a 2-mi buffer and selected undeveloped comparison areas	Annually during March to mid_May	Each known lek will be visited at least once annually by the BLM and/or an Operator-financed BLM-approved biologist; subsequent visits will occur at BLM-selected leks by the BLM, and/or Operator-financed BLM_approved biologist
Other studies on areas with \$8 locations/section and selected undeveloped comparison areas	Year-long and in any year as deemed necessary by BLM and/or USFWS	USFWS and/or BLM with Operator- and other party_provided financial assistance (Operator assistance will not exceed \$5,000 in any year)

¹ With Operator assistance, it is anticipated that agency obligations will not greatly exceed currently approved personnel or financial commitments.

Table D-2.3 Summary of General APD/ROW Application Stage Survey/Protection Measures, Continental Divide/Wamsutter II Natural Gas Project, Sweetwater and Carbon Counties, 1999.

Protection Measure	Dates	Responsible Entity
APD-stage general raptor nest survey/ inventory within 0.75 to 1.0 mi of proposed disturbance	Yearlong	BLM, Operators
APD-stage seasonal raptor nest avoidance within 0.5 to 1.0 mi of active nests	February 1 - July 31 (seasonal restriction)	Operators, BLM
APD-stage general raptor nest avoidance within 825 ft of active nests (1,200 ft for active ferruginous hawk nests)	Yearlong (Controlled Surface Use [CSU] generally excluding surface disturbance)	Operators, BLM
APD-stage TEC&SC surveys (within 0.5mi of proposed disturbance sites)	As necessary	BLM or Operators
APD-stage TEC&SC avoidance	As necessary	Operators, BLM
APD-stage prairie dog colony mapping and burrow density determinations	As necessary	Operators, BLM
Black-footed ferret habitat (i.e., prairie dog colony) avoidance	Where practical	Operators, BLM
Black-footed ferret surveys where suitable habitat must be disturbed	As necessary in appropriate season no more than 1 year prior to disturbance	Operator-financed USFWS_approved biologist
APD-stage mountain plover surveys (within 200 m of proposed disturbance)	As necessary between April 15 and June 30	BLM or Operator_financed BLM_approved biologist
Mountain plover nest/brood avoidance	As necessary	Operators, BLM
APD-stage western burrowing owl surveys (within 0.5 mi of proposed disturbance sites)	As necessary during June_August	BLM or Operator_financed BLM_approved biologist
Western burrowing owl nest avoidance	As necessary	Operators, BLM
APD-stage sage grouse lek surveys on suitable habitats within 2mi of proposed disturbance sites	March 1 _ mid-May	Operators, BLM
APD-stage sage grouse lek avoidance on areas within 2.0 mi of a lek	March 1 - June 30	Operators, BLM
APD-stage sage grouse lek avoidance on areas within 0.25 mi of a lek	Yearlong (CSU generally excluding surface disturbance)	Operators, BLM
APD-stage sage grouse nest avoidance	As necessary	Operators, BLM
Big game crucial winter range avoidance	November 15 _ April 30	Operators, BLM
APD-stage general wildlife avoidance/protection	As necessary	Operators, USFWS, BLM

(GIS) will be used for information storage, retrieval, and planning, and annual GIS data updates will be conducted. Raw data collected each year also will be provided to other management agencies (e.g., WGFD, USFWS, Wyoming Natural Diversity Database [WNDDDB]) at the request of these agencies. In addition, sources of potential disturbance to wildlife will be identified, where practical (e.g., development activities, weather conditions, etc.).

Additional reports may be prepared in any year, as necessary, to comply with other relevant wildlife laws, rules, and regulations (e.g., black-footed ferret survey reports [see SectionD_2.2.2.1]).

D-2.1.2 Additional Meetings

Meetings will be held as necessary in any given year by the BLM, Operators, and/or USFWS in Rawlins to inform and update Operator personnel on the findings of the annual reports. Other management agencies and user groups (e.g., WGFD, landowners, grazing permittees, recreationists) will also be invited to attend meetings and cooperate in the implementation of this plan. Relevant wildlife laws, rules, and regulations may be discussed, as will project-specific wildlife monitoring and protection protocol for the upcoming year. Operators and other interested parties will have the opportunity to provide annual input regarding proposed inventory, monitoring, and protection measures; however, the BLM will maintain the authority for determining the final nature of these activities in any given year. Additional information on the nature of the wildlife present in the CD/WIIPA, potential impacts to wildlife, appropriate Operator responses to wildlife encounters to avoid or minimize impacts, and other items (e.g., species identification) also may be presented at these meetings as deemed necessary and specified in annual reports.

D-2.2 ANNUAL INVENTORY AND MONITORING

Inventory and monitoring protocol will be as identified below for each wildlife species/category. These protocol will be unchanged across development alternatives, except as authorized by the BLM or specified in this plan. Additional wildlife species/categories and associated surveys may be added or wildlife species/categories and surveys may be omitted in future years, pending results presented in the coordinated review of annual wildlife reports. The WGFD will be contacted during the coordination of survey and other data acquisition phases. Opportunistic wildlife observations may be made throughout the year by agency and Operator personnel present in the CD/WIIPA.

The frequency of inventory and monitoring will be dependent upon the level of development in the CD/WIIPA (see Tables D_2.1 and D_2.2). In general, inventory and monitoring frequency will increase with increased levels of development. Inventory and monitoring results may lead to further currently unidentifiable studies (e.g., scientific studies specifically designed to determine cause and effect). The following sections identify the minimum level of effort required by this wildlife plan. Site- and species-specific surveys will continue to be conducted in association with APD and ROW application field reviews (see TableD_2.3).

D-2.2.1 Raptors

Raptor inventories of potentially affected areas (see MapD_1.1 and TableD_2.1) will be conducted in April/May of 1998 and every 5 years thereafter for the LOP to determine the location of raptor nests/territories and their activity status by the BLM. Known raptor concentration areas and approximate nest locations on and adjacent to the CD/WIIPA are shown on MapD_2.1. These surveys may be implemented aerially (e.g., via helicopter) or from the ground. Operators will provide financial assistance for aircraft rental. Data collected during the surveys will be recorded on Raptor Nesting Record, Raptor Observation Data Sheets, or other similar data forms (see Addendum D-B). (Burrowing owl survey requirements are discussed in Section D-2.2.2.4).

Nest productivity monitoring will be conducted by the BLM at active nests that are located within 1 mi of project-required disturbance areas between March 1 and mid-July to determine nesting success (i.e., number of nestlings/fledglings). These surveys generally will be conducted from the ground, and attempts will be made to determine the cause of any documented nest failure. Operators will provide financial assistance for aircraft rental, as necessary.

Additional raptor nest activity and productivity monitoring measures will be applied in areas with high levels of development (i.e., areas with § 4 locations/section) on and within 1 mi of the CD/WIIPA (see TableD_2.2). Inventory/monitoring efforts in these areas, as well as selected undeveloped comparison areas, will be conducted annually during April and May, followed by nest productivity monitoring. Site_ and species_specific raptor nest inventories will also continue to be conducted as necessary in association with all APD and ROW application field reviews (see TableD_2.3).

All raptor nest/productivity surveys will be conducted using procedures that minimize potential adverse effects to nesting raptors. Specific survey measures for reducing detrimental effects are listed in Grier and Fyfe (1987) and Call (1978) and include the following.

- Nest visits will be delayed for as long as possible in the nesting season.
- Nests will be approached cautiously, and their status (i.e., number of nestlings/fledglings) will be determined from a distance with binoculars or a spotting scope.
- Nests will be approached tangentially and in an obvious manner to avoid startling adults.
- Nests will not be visited during adverse weather conditions (e.g., extreme cold, precipitation events, windy periods, hottest part of the day).
- Visits will be kept as brief as possible and in no instance will be greater than 10 minutes.
- All inventories will be coordinated by the BLM.
- The number of nest visits in any year will be kept to a minimum.
- All raptor nest location data will be considered confidential.

D-2.2.2 Threatened, Endangered, Candidate, and Other Species of Concern

The level of inventory/monitoring required for threatened, endangered, candidate, and other species of concern (TEC&SC) will be commensurate with established protocol for the potentially affected species. Survey protocol developed in conjunction with the Biological Assessment for this project (see EIS Appendix E) will be conducted as a component of this wildlife protection plan. Methodologies and results of these surveys will be included in annual reports or provided in separate supplemental reports. A preliminary list of TEC&SC species proposed for management and known from or potentially occurring in the vicinity of the CD/WIIPA is shown on TableD_2.4. As TEC&SC species are added to or withdrawn from USFWS, BLM, and/or WGFD lists, appropriate modifications will be incorporated to this plan and specified in annual reports. Additional species of concern known from or potentially occurring in the vicinity of the CD/WIIPA are shown on TableD_2.5.

TEC&SC data collected during the surveys identified in Tables D-2.2 and D-2.3 and described below will be considered confidential and will be provided only as necessary to those requiring the data for specific management and/or project development needs. Site- and species_specific TEC&SC surveys will continue to be conducted as necessary in association with all APD and ROW application field reviews (see TableD_2.3). Data will be collected on appropriate General Wildlife Observation Data Sheets or other similar forms (see Addendum D-B). Alternate/additional forms may be used as specified by the BLM.

D-2.2.2.1 Black-footed Ferret

BLM-approved Operator-financed biologists will determine the presence/absence of prairie dog colonies at each proposed development site during APD and ROW application field revisions (see TableD_2.3). Sections with current and/or historic prairie dog colonies are shown on MapD_2.2. Prairie dog colonies (i.e., potential black-footed ferret habitat) on the area will be mapped and burrow densities determined by a BLM-approved Operator-financed biologist, as necessary and in association with proposed development plans (i.e., APD and ROW application reviews). Colonies that meet USFWS criteria as potential black-footed ferret habitat (USFWS 1989) will be surveyed for black-footed ferrets by an USFWS-certified Operator-financed surveyor prior to BLM authorizing disturbance of these colonies. Surveys will only be conducted as deemed necessary during consultation with the BLM and/or USFWS. Black-footed ferret surveys will be conducted in accordance with USFWS guidelines (USFWS 1989) and will be conducted on a site-specific basis, depending on the areas proposed for disturbance in a given year as specified in the annual report.

D-2.2.2.2 Bald Eagle, Peregrine Falcon, and Ferruginous Hawk

Inventory and monitoring protocol for bald eagle, peregrine falcon, and ferruginous hawk will be as described for raptors (see Section D-2.2.1).

D-2.2.2.3 Mountain Plover

Suitable mountain plover habitat (i.e., areas with vegetation less than 4 inches high) within 656 ft (200 meters) of proposed disturbance areas (as identified in annual wildlife reports) will be surveyed within 2 weeks of disturbance by the BLM or a BLM-approved Operator-financed Operator biologist to detect the presence of plovers (see TableD_2.3). Surveys will be conducted on these areas during the period of April 15 through June 30. If plovers are not found, no additional surveys will be conducted. If plovers are discovered, observations will continue for sufficient duration to determine if a mountain plover nest is present. If no nesting is discovered, no additional surveys will be conducted. If nesting is discovered, surveys will be conducted on and within 656 ft of areas proposed for development during the period of April 15 through June 30 no more than 14 days prior to the date that ground-disturbing activities are initiated. If development is proposed for the period of April 15 through April 30 or June 15 through June 30, a single survey will be required; however, if ground-disturbing activities are proposed for the period of May 1 through June 15, three surveys will be required. If three surveys are required, these surveys will be made at least 14 days apart, with the last survey no more than 14 days prior to the initiation of ground-disturbing activities. Where access roads and/or well locations have been constructed prior to the mountain plover nesting season and use of these areas has not been initiated for development actions, site investigations of these disturbed areas will be conducted prior to use to determine whether mountain plover are present.

D-2.2.2.4 Western Burrowing Owl

In association with APD and ROW application field reviews, prairie dog colonies and other suitable burrowing owl nesting areas (i.e., areas with large numbers of ground squirrel burrows) on and within 0.5 mi of existing and proposed disturbance areas will be searched for western burrowing owls by the BLM or a BLM-approved Operator-financed biologist during June through August to determine the presence or absence of owl nesting (see TableD_2.3). Efforts will be made to determine reproductive success.

D-2.2.2.5 Other TEC&SC Species

Surveys for other TEC&SC species will be conducted by the BLM or a BLM-approved Operator-financed biologist in areas of potential habitat within 0.5 mi of proposed disturbance sites prior to disturbance (see TableD_2.3). These surveys may be implemented in conjunction with surveys for other species or as

components of APD and/or ROW application processes. In addition, in areas where four or more surface locations are developed, the entire section plus a 1.0_mi buffer, as well as selected undeveloped comparison areas, will be surveyed annually during spring and summer by a BLM_approved Operator_financed biologist for selected TEC&SC species (see TableD_2.2). If any TEC&SC species are observed, the observations will be noted on appropriate data forms (see Addendum D-B). In addition, when and if TEC&SC species are observed, efforts will be made to determine their activities (e.g., breeding, nesting, foraging, hunting, etc.). If any management agency (e.g., BLM, USFWS) identifies a potential for concern regarding any of these species, additional inventory and monitoring may be implemented as specified in annual reports.

D-2.2.3 Sage Grouse

Sage grouse lek inventories will be conducted on the CD/WIIPA and a 2-mi buffer to determine lek locations every 5 years (see TableD_2.1). The approximate locations of known leks on the area are shown on MapD_2.3. Inventories will be conducted by the BLM and will be implemented two times, a minimum of 10 days apart, during March and April every fifth year of this plan. Surveys may be conducted aerially, with Operator_provided financial assistance for aircraft rental, or on the ground, as deemed appropriate by the BLM; aerial surveys will be used only to determine lek locations. In areas with four or more well locations per section, aerial inventories will be conducted annually on affected sections, 2-mi buffers, and selected undeveloped comparison areas (see TableD_2.2).

Selected leks within 2 mi of existing and proposed disturbance areas will be monitored annually to determine lek attendance by the BLM between March 1 and May 15, such that all leks on these areas are monitored at least once every 3 years (see TableD_2.1). In the event that more than four well locations occur within a section the responsibility for lek monitoring will include a BLM-approved, Operator_financed biologist (see TableD_2.2). Monitoring efforts will be implemented at all leks present on affected sections, 2_mibuffers, and selected undeveloped comparison areas. The BLM will direct lek monitoring efforts (timing, locations) such that all efforts are made to have the same individuals monitor the same leks within and across years. Data collected during these surveys will be provided on Sage Grouse Lek Records or other suitable forms (see AddendumD-B).

Standard site- and species_specific sage grouse lek surveys will continue to be conducted as necessary in association with all APD and ROW application field reviews (see TableD_2.3).

D-2.2.4 Big Game Crucial Winter Range Use

To determine the need for the application of crucial winter range seasonal stipulations and assess potential impacts to big game species occurring on the CD/WIIPA, data on big game use of crucial winter ranges on the CD/WIIPA and an adjacent 1-mi buffer will be requested annually by the BLM from the WGFD, as deemed necessary by the BLM (see TableD_2.1). Big game crucial winter ranges are shown on MapD_2.4.

D-2.2.5 Other Inventory and Monitoring Measures

Additional inventory and monitoring measures may be applied as specified in annual reports. In areas where development levels reach eight or more well locations per section, it is anticipated that detailed cause and effect studies will be implemented (see TableD_2.2). Actions also may be applied for passerine birds, herpetiles, lagomorphs, and small mammals. Surveys will be conducted in adherence with protocol to be established by the BLM, USFWS, and Operators and may be similar to procedures specified by the Wyoming Department of Environmental Quality-Land Quality Division (WDEQ-LQD) for surface coal mine baseline studies (WDEQ-LQD 1995). Operator financial assistance for these investigations will not exceed \$5,000 in any year.

Table D-2.4 Threatened, Endangered, Candidate, and Species of Concern Proposed for Management and Documented or Potentially Occurring on or in the Vicinity of the Continental Divide/Wamsutter II Natural Gas Project Area, 1999.¹

Species		Status ^{2, 3}				Documented on or in Vicinity of the CD/WIIPA4	Habitat Type(s) ⁵
Common Name	Scientific Name	USFWS	BLM	WGFD	WNDDDB		
Peregrine falcon	<i>Falco peregrinus</i>	LE	X	X	X	Yes ⁶	UB
Whooping crane	<i>Grus americana</i>	LE	X	X	X	No	FT
Black-footed ferret	<i>Mustela nigripes</i>	LE	X	X	X	Yes ⁷	BS, BG, SB, DS, MG
Bald eagle	<i>Haliaeetus leucocephalus</i>	LT	X	X	X	Yes	UB
Mountain plover	<i>Charadrius montanus</i>	C	X	X	X	Yes ⁶	DS, MG
White-faced ibis	<i>Plegadis chihi</i>	SC	X	X	--	No	FT(P/R)
Swift fox	<i>Vulpes velox</i>	C	X	X	X	Yes ⁷	MG, SR
Northern goshawk	<i>Accipiter gentilis</i>	SC	X	X	X	Yes ⁶	FT
Ferruginous hawk	<i>Buteo regalis</i>	SC	X	X	X	Yes ⁶	UB
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	SC	X	--	X	Yes ⁶	BS, BG, SB, DS, MG
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC	X	--	X	Yes ⁶	UB
Turkey vulture	<i>Cathartes aura</i>	--	X	--	--	Yes ⁶	UB
Osprey	<i>Pandion haliaetus</i>	--	X	--	--	No	FT
Northern harrier	<i>Circus cyaneus</i>	--	X	--	--	Yes ⁶	UB
Sharp-shinned hawk	<i>Accipiter striatus</i>	--	X	--	--	Yes ⁶	FT
Cooper's hawk	<i>Accipiter cooperii</i>	--	X	--	--	Yes ⁶	FT
Swainson's hawk	<i>Buteo swainsoni</i>	--	X	--	--	Yes ⁶	PJ, SR
Red-tailed hawk	<i>Buteo jamaicensis</i>	--	X	--	--	Yes ⁶	UB
Rough-legged hawk	<i>Buteo lagopus</i>	--	X	--	--	Yes	UB
Golden eagle	<i>Aquila chrysaetos</i>	--	X	--	--	Yes ⁶	UB
American kestrel	<i>Falco sparverius</i>	--	X	--	--	Yes ⁶	UB
Merlin	<i>Falco columbarius</i>	--	X	X	X	Yes ⁶	UB

Prairie falcon	<i>Falco mexicanus</i>	--	X	--	--	Yes ⁶	UB
Barn owl	<i>Tyto alba</i>	--	X	--	X	Yes	UB
Great horned owl	<i>Bubo virginianus</i>	--	X	--	--	Yes ⁶	UB
Long_eared owl	<i>Asio otus</i>	--	X	--	--	Yes ⁶	UB
Short_eared owl	<i>Asio flammeus</i>	--	X	--	--	Yes ⁶	UB
Common loon	<i>Gavia immer</i>	--	X	X	X	Yes	FT (SR)
American white pelican	<i>Pelecanus erythrorhynchos</i>	--	X	X	X	Yes	SR
American bittern	<i>Botaurus lentiginosus</i>	--	X	X	X	Yes	FT (SR)
Snowy egret	<i>Egretta thula</i>	--	X	X	X	Yes	FT (SR)
Black_crowned night heron	<i>Nycticorax nycticorax</i>	--	X	X	X	Yes	FT (SR)
Long_billed curlew	<i>Numenius americanus</i>	--	X	X	X	Yes ⁶	BS, SR, MG
Caspian tern	<i>Sterna caspia</i>	--	X	X	X	Yes	FT (SR)
Forster's tern	<i>Sterna forsteri</i>	--	X	X	X	Yes	FT (SR)
Yellow_billed cuckoo	<i>Coccyzus americanus</i>	--	X	X	X	No	FT
Lewis' woodpecker	<i>Melanerpes lewis</i>	--	X	X	X	Yes ⁶	SR, PJ
Ash_throated flycatcher	<i>Myiarchus cinerascens</i>	--	X	X	X	Yes ⁶	PJ, FT
Scrub jay	<i>Aphelocoma coerulescens</i>	--	X	X	X	Yes ⁶	PJ, FT
Plain titmouse	<i>Parus inornatus</i>	--	X	X	X	Yes ⁶	PJ, FT
Bushtit	<i>Psaltiriparus minimus</i>	--	X	X	X	Yes ⁶	PJ, FT
Scott's oriole	<i>Icterus parisorum</i>	--	X	X	X	Yes ⁶	PJ, FT
Dwarf shrew	<i>Sorex nanus</i>	--	X	X	X	Yes ⁶	UB
Vagrant shrew	<i>Sorex vagrans</i>	--	X	X	--	No	SR, BS, SB, BG
Little brown myotis	<i>Myotis lucifugus</i>	--	X	X	--	Yes	UB
Big brown bat	<i>Eptesicus fuscus</i>	--	X	X	--	Yes	UB
Pallid bat	<i>Antrozous pallidus</i>	--	X	X	X	Yes	UB
Cliff chipmunk	<i>Tamias dorsalis</i>	--	X	X	X	Yes ⁶	SR, PJ, BS
Canyon mouse	<i>Peromyscus crinitus</i>	--	X	X	X	No	PJ, B/R
Pinyon mouse	<i>Peromyscus truei</i>	--	X	X	X	Yes ⁶	BS, B/R, PJ

Northern leopard frog	<i>Rana pipiens</i>	--	X	X	--	Yes	SR
Northern plateau lizard	<i>Sceloporus undulatus elongatus</i>	--	X	X	--	Yes	BS, B/R
Northern tree lizard	<i>Urosaurus ornatus</i>	--	X	X	--	Yes	BS, B/R
Great Basin gopher snake	<i>Pituophis melanoleucus deserticola</i>	--	X	X	--	Yes	UB
Midget faded rattlesnake	<i>Crotalus viridis concolor</i>	--	X	X	--	Yes	BS

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- ¹ Wyoming Natural Diversity Database (WNDDDB) searches (1995, 1997); U.S. Fish and Wildlife consultation (1995, 1997); Wyoming Game and Fish Department (WGFD) list of priority species (1997); and Fertig (1997).
- ² USFWS = U.S. Fish and Wildlife Service, WGFD = Wyoming Game and Fish Department, WNDDDB = Wyoming Natural Diversity Database, and BLM = Bureau of Land Management.
- ³ LE = USFWS listed endangered, LT = USFWS listed threatened, WNDDDB; C = USFWS candidate species (proposed threatened), SC = USFWS species of concern, X=given special status by the agency listed (i.e., WGFD, WNDDDB, and/or BLM species of concern).
- ⁴ Indicates documentation of amphibian, reptile, or plant species in Sweetwater or Carbon County (Baxter and Stone 1980; Fertig 1997); documentation of bird species within latitude 41E, longitude 107_109E (Dorn and Dorn 1990; WGFD 1992, 1996); and/or documentation of mammal species within latitude 41E, longitude 107_109E (WGFD 1992, 1996).
- ⁵ As described in Section 3.2.1 of the EIS: BS = big sagebrush, BG = black greasewood, DS = desert shrub, B/R = basin/exposed rock, SB = saltbush, SR = shrub_dominated riparian, MG = mixed grass prairie, UP=unvegetated playa, PJ = small pockets of pine and/or juniper woodland, UB=ubiquitous, FT=flythrough.
- ⁶ Species has been documented breeding within latitude 41E, longitude 107_109E (Dorn and Dorn 1990; WGFD 1992).
- ⁷ Documentation of historical observation only (WGFD 1992; WNDDDB 1995).

Table D-2.5 Other Species of Concern Documented or Potentially Occurring on or in the Vicinity of the Continental Divide/Wamsutter II Natural Gas Project Area, 1999.¹

Species		Status ^{1, 2}		Documented on or in Vicinity of the CD/WIIPA4	Habitat Type(s) ⁵
Common Name	Scientific Name	USFWS	WNDDDB		
Western boreal toad	<i>Bufo boreas boreas</i>	SC	--	Yes	SR, P/R
Trumpeter swan	<i>Cygnus buccinator</i>	SC	--	Yes	FT(P/R)
Black tern	<i>Chlidonias niger</i>	SC	--	Yes	FT(P/R)
Small-footed myotis	<i>Myotis ciliolabrum</i>	SC	--	Yes	BS, BG, DS, B/R, SR, MG, PJ
Long-eared myotis	<i>Myotis evotis</i>	SC	--	Yes	BS, BG, DS, SB, SR, PJ
Long-legged myotis	<i>Myotis volans</i>	SC	--	Yes	SR, PJ
Spotted bat	<i>Euderma maculatum</i>	SC	--	No	BS, BG, DS, B/R, SB, P/R
Townsend's big-eared bat	<i>Plecotus townsendii</i>	SC	--	Yes	DS, PJ
Pygmy rabbit	<i>Sylvilagus idahoensis</i>	SC	--	Yes	BS, SR
Eastern shorthorned lizard	<i>Phrynosoma douglassi</i> <i>brevirostre</i>	--	X	Yes	UB
Northern sagebrush lizard	<i>Sceloporus graciosus</i>	--	X	Yes	BS, BG, SB, DS, B/R
Columbian sharp-tailed grouse	<i>Tympanuchus phasianellus</i> <i>columbianus</i>	--	X	Yes ⁶	BS, BG, SB, SR, MG
Common tern	<i>Sterna hirundo</i>	--	X	Yes	FT (SR)
Baird's sparrow	<i>Ammodramus bairdii</i>	--	X	No	FT (MG)
Horned grebe	<i>Podiceps auritus</i>	--	X	Yes	FT (P/R)
Red-necked grebe	<i>Podiceps grisegena</i>	--	X	Yes	FT (P/R)
Clark's grebe	<i>Aechmophorus clarkii</i>	--	X	Yes	FT (P/R)
Ring-necked duck	<i>Aythya collaris</i>	--	X	Yes	FT (P/R)
Common goldeneye	<i>Bucephala clangula</i>	--	X	Yes	SR

Bufflehead	<i>Bucephala albeola</i>	--	X	Yes	SR
Red-breasted merganser	<i>Mergus serrator</i>	--	X	Yes	FT (SR)
Virginia rail	<i>Rallus limicola</i>	--	X	Yes ⁶	FT (SR)
Western snowy plover	<i>Charadrius alexandrinus</i>	--	X	Yes ⁶	FT (SR)
Piping plover	<i>Charadrius melodus</i>	--	X	Yes	FT
Black-necked stilt	<i>Himantopus mexicanus</i>	--	X	Yes ⁶	FT (SR)
Upland sandpiper	<i>Bartramia longicauda</i>	--	X	Yes	FT (MG)
Red-necked phalarope	<i>Phalaropus lobatus</i>	--	X	Yes	FT (SR)
Franklin's gull	<i>Larus pipixcan</i>	--	X	Yes	FT (SR)
Ring-billed gull	<i>Larus delawarensis</i>	--	X	Yes	FT
California gull	<i>Larus californicus</i>	--	X	Yes	FT
Herring gull	<i>Larus argentatus</i>	--	X	Yes	FT (SR)
Black-tailed cuckoo	<i>Coccyzus erythrophthalmus</i>	--	X	Yes	FT
Black-chinned hummingbird	<i>Archilochus alexandri</i>	--	X	Yes ⁶	SR, PJ
Three-toed woodpecker	<i>Picoides tridactylus</i>	--	X	Yes ⁶	FT
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>	--	X	Yes ⁶	PJ, SR
Eastern bluebird	<i>Sialia sialis</i>	--	X	Yes ⁶	SR, PJ, MG
Red-eyed vireo	<i>Vireo olivaceus</i>	--	X	Yes ⁶	FT
Virginia's warbler	<i>Vermivora virginiae</i>	--	X	Yes ⁶	PJ, FT
Black-throated gray warbler	<i>Dendroica nigrescens</i>	--	X	Yes ⁶	PJ, FT
Blue grosbeak	<i>Guiraca caerulea</i>	--	X	Yes	FT (SR)
Indigo bunting	<i>Passerina cyanea</i>	--	X	Yes	BS, BG, SB, SR
Dickcissel	<i>Spiza americana</i>	--	X	No	FT
Clay-colored sparrow	<i>Spizella pallida</i>	--	X	Yes	FT (SR, PJ)
Black-throated sparrow	<i>Amphispiza bilineata</i>	--	X	No	FT
Chestnut-collared longspur	<i>Calcarius ornatus</i>	--	X	Yes	FT

Bobolink	<i>Dolichonyx oryzivorus</i>	--	X	Yes ⁶	BS, BG, SB, SR, MG
Red bat	<i>Lasiurus borealis</i>	--	X	Yes	FT
Hoary bat	<i>Lasiurus cinereus</i>	--	X	Yes	UB
Allen's thirteen-lined ground squirrel	<i>Spermophilus tridecemlineatus alleni</i>	--	X	Yes ⁶	UB
Spotted ground squirrel	<i>Spermophilus spilosoma</i>	--	X	Yes ⁶	BS, SB, MG
White_tailed prairie dog	<i>Cynomys leucurus</i>	--	X	Yes ⁶	BS, BG, SB, DS, MG
Wyoming pocket gopher	<i>Thomomys clusius</i>	--	X	Yes ⁶	BG, BR, SB, DS
Silky pocket mouse	<i>Perognathus flavus</i>	--	X	Yes ⁶	UB
Great Basin pocket mouse	<i>Perognathus parvus</i>	--	X	Yes ⁶	BS, BG, SB, SR
White_footed mouse	<i>Peromyscus leucopus</i>	--	X	No	UB
Western spotted skunk	<i>Spilogale gracilis</i>	--	X	No	BS, BG, SB, SR, MG

¹ Wyoming Natural Diversity Database (WNDDDB) searches (1995, 1997); U.S. Fish and Wildlife consultation (1995, 1997); Wyoming Game and Fish Department (WGFD) list of priority species (1997);and Fertig (1997).

² USFWS = U.S. Fish and Wildlife Service, WNDDDB = Wyoming Natural Diversity Database.

³ SC = USFWS species of concern, X = given special status by the agency listed (i.e., USFWS, WNDDDB).

⁴ Indicates documentation of amphibian, reptile, or plant species in Sweetwater or Carbon County (Baxter and Stone 1980; Fertig 1997); documentation of bird species within latitude 41E, longitude 107_109E (Dorn and Dorn 1990; WGFD 1992, 1996); and/or documentation of mammal species within latitude 41E, longitude 107_109E (WGFD 1992, 1996).

⁵ As described in Section 3.2.1 of the EIS: BS = big sagebrush, BG = black greasewood, DS = desert shrub, B/R = basin/exposed rock, SB = saltbush, SR = shrub_dominated riparian, MG=mixed grass prairie, UP=unvegetated playa, PJ = small pockets of pine and/or juniper woodland, UB=ubiquitous, P/R = pond/riparian, FT=flythrough.

⁶ Species has been documented breeding within latitude 41E, longitude 107_109E (Dorn and Dorn 1990; WGFD 1992).

⁷ Documentation of historical observation only (WGFD 1992; WNDDDB 1995).

D-2.2.6 General Wildlife

BLM staff will be responsible for keeping records of selected wildlife species observed during the course of their activities on the CD/WIIPA, and interested Operator personnel may also provide data on wildlife observations. The information provided will include observations of wildlife species, their numbers, location, activity, and other pertinent data as applicable and identified on the General Wildlife Observation Data Sheet presented in Addendum D-B of this plan. Some of the desired information may be difficult for Operators to define (e.g., specific locations in U.S. Geological Survey [USGS] coordinates, species type for hard to recognize species [passerine birds and small mammals], sex). Where Operators are uncertain of the USGS coordinates for an observation, a general description of the location may be provided (e.g., 100 yards north of well #___), and in instances where species or sex information are questionable, Operators will identify the observation as such.

D-2.3 PROTECTION MEASURES

The wildlife protection measures proposed herein have been developed from past measures identified for oil and gas developments in Wyoming. Additional measures may be included and/or existing measures may be modified in any given year as allowable and as deemed appropriate by BLM in consultation with Operators and other interested parties, and these measures will be specified in annual reports. It is assumed that as the wildlife of the CD/WIIPA are further described and impacts identified, some protection measures will be removed, whereas others may be added. Protection measures will be implemented by Operators with assistance from and/or in consultation with the BLM. In addition, these measures may be modified on a site-specific basis as deemed appropriate by the BLM after completion of APD and ROW application field reviews.

The principle protection measure for most wildlife species will be avoidance of sensitive/crucial habitats (e.g., big game crucial winter ranges, raptor nests, sage grouse leks), where possible. However, numerous species- and project-specific measures may be implemented. Additionally, general wildlife protection measures (see Section D_2.3.5) will likely benefit the majority of wildlife species found on and adjacent to the CD/WIIPA.

D-2.3.1 Raptors

The primary protection measure for raptor species on the CD/WIIPA will be avoidance of active nest locations during the breeding season. Active nests are defined as any raptor nest that has been used within the last 3 years. Depending upon the timing of proposed construction and drilling activities, all surface-disturbing activities will be restricted from February 1 through July 31 within a 0.5- to 1.0-mi radius (depending upon species and site-specific conditions) of active or occupied raptor nests/nesting territories (i.e., seasonal nest avoidance). This measure may be excepted where raptor pairs are documented using alternate nests greater than 1.0 mi from the surface disturbance area within a nesting territory. In addition, well locations, roads, ancillary facilities, and other surface structures requiring a repeated human presence will not be constructed within 825 ft of active raptor nests, except ferruginous hawk, where the restriction will be to 1,200 ft (restrictions will generally exclude surface disturbance). The seasonal buffer distance and exclusion dates may vary, depending on factors such as nest activity status, species, prey availability, natural topographic barriers, and line-of-sight distances. Actual nest buffers for each active raptor nest will be established in annual reports.

Operators will notify the BLM immediately if raptors are found nesting on or within 1,200 ft of project facilities, and Operators will assist the BLM as necessary in erecting artificial nesting structures (ANSs), as appropriate. The use of ANSs will be considered as a last resort for raptor protection. If nest manipulation or a situation requiring a "taking" of a raptor nest becomes necessary, a special permit will be obtained from the

Denver USFWS Office, Permit Section. Permit acquisition will be coordinated with the Wyoming State USFWS Office in Cheyenne and will be initiated with sufficient lead time to allow for development of mitigation. Required corresponding permits will be obtained from the WGFD in Cheyenne. Consultation and coordination with the USFWS and WGFD will be conducted for all protection activities relating to raptors.

If it is found that project activities could potentially affect raptor nesting on or adjacent to the CD/WIIPA as determined from decreased raptor productivity or nesting or documented nest abandonment or failure, ANSs may be constructed at a rate of up to two ANSs for one impacted nest, or existing degraded raptor nests may be upgraded/reinforced to minimize potential impacts. The location, design, and other pertinent data regarding ANSs or nests proposed for upgrading will be identified in annual reports, and these ANSs will be located within the nesting territory of potentially affected raptor pairs and outside of the line-of-sight or nest buffer of actively nesting pairs, where possible. Operators will be responsible for the annual maintenance of ANSs throughout the LOP. Annual ANS maintenance activities will be completed after August 1 and prior to October 15 each year, as necessary. ANSs will be placed within the nesting territories of potentially affected raptor pairs at sites sufficiently removed from development activities to minimize or avoid potential adverse effects. All ANSs on public lands will become the property of the BLM upon completion of the project.

In cases where existing project features (e.g., well locations) are located within the nest buffers of active raptor nests, no extensive maintenance activities (e.g., workovers) will be allowed during critical periods (i.e., approximately early March through mid-June). The exact dates of exclusion will be determined by the BLM and will likely vary between nests and from year to year, depending on the species present and variations in weather, nesting chronology, and other factors.

Any powerline construction will follow the recommendations of the Avian Power Line Interaction Committee (APLIC) (1994, 1996) and Olendorff et al. (1981) to avoid collisions and/or electrocution of raptors.

D-2.3.2 TEC&SC

USFWS and WGFD consultation and coordination will be conducted for all protection activities relating to TEC&SC species and their habitats. Where possible, these actions will be specified in advance in the annual reports.

D-2.3.2.1 Black-footed Ferret

In general, all prairie dog colonies on the CD/WIIPA will be avoided, where practical. If prairie dog colonies of sufficient size and burrow density for black-footed ferrets are scheduled to be disturbed, as identified in annual reports, black-footed ferret surveys of these colonies will be conducted pursuant to BLM and/or USFWS decisions made during informal consultations. Survey protocol will adhere to USFWS guidelines as established in USFWS (1989) and will be conducted by a USFWS-qualified biologist a maximum of 1 year in advance of the proposed disturbance. Reports identifying survey methods and results will be prepared and submitted to the USFWS and BLM in accordance with Section 7 of the *Endangered Species Act of 1973*, as amended, and the Interagency Cooperation Regulations. Surveys will be financed by the Operators. If black-footed ferrets are found on the CD/WIIPA, the USFWS will be notified immediately and formal consultations will be initiated to develop strategies that ensure no adverse effects to the species. Before ground-disturbing activities are initiated in black-footed ferret habitat, authorizations to proceed must be received from the BLM, in consultation with the USFWS.

D-2.3.2.2 Bald Eagle, Peregrine Falcon, and Ferruginous Hawk

Protection protocol generally will be as described for raptors (see Section D_2.3.1). Additional measures will be applied on a species- or site-specific basis, as deemed appropriate by the USFWS and/or BLM, and specified in annual reports.

D-2.3.2.3 Mountain Plover

Mountain plover habitats (e.g., cushion plant communities, playa lakes, areas with vegetation <4 inches in height) will be avoided where practical, and where these habitats will be disturbed, reclamation will utilize procedures designed to reestablish suitable plover habitat.

If an active mountain plover nest is observed within survey areas (see Section D-2.2.2.3), planned development activities will be delayed at least 37 days or 1 week post-hatching. If a brood of flightless chicks is discovered, planned activities will be delayed at least 7 days. Road construction and maintenance (i.e., grading) activities will be minimized from May 25 to June 30 and, where practical, no new surface-disturbing activities will be conducted from April 1 to June 30 within 656 ft of identified mountain plover concentration areas (i.e., areas where broods and/or adults have been observed in the current year or documented in at least 2 of the past 3 years).

D-2.3.2.4 Western Burrowing Owl

Other than the avoidance of prairie dog colonies and other appropriate nesting habitat, where practical (see Section D-2.3.2.1) and the avoidance of active raptor nests during the nesting period (see Section D-2.3.1), no additional species-specific protection measures are proposed.

D-2.3.2.5 Other TEC&SC Species

If, during surveys of areas within 0.5 mi of proposed disturbance sites (see Section D_2.2.2.5), nests or other crucial features for any TEC&SC species are found (e.g., loggerhead shrike nests), avoidance of these features will be accomplished in consultation and coordination with the BLM, USFWS, and WGFD. Construction activities in these areas will be curtailed until there is concurrence between BLM, USFWS, and WGFD on what activities can be authorized. Activities will, in most cases, be delayed until such time that no adverse effects will occur (e.g., after fledging).

No additional protection measures will be applied for other sensitive species potentially present on the CD/WIIPA; however, it is assumed that the protocol specified in Section D_2.3.5 for general wildlife will likely benefit TEC&SC species as well. If any management agency (i.e., BLM, WGFD, USFWS) identifies a potential for impacts to any TEC&SC species, additional measures may be implemented as specified in annual reports.

D-2.3.3 Sage Grouse

Surface disturbance and actions that create permanent and high-profile structures such as buildings and storage tanks which are suitable as raptor perches will not be constructed within 0.25 mi of sage grouse leks on and adjacent to the CD/WIIPA. In addition, power lines will not be constructed within 0.6 mi of leks, as necessary to protect leks from raptor predation. To protect nesting sage grouse, Operators will restrict construction activities between March 1 and June 30 within a 2.0-mi radius of active sage grouse leks on suitable sage grouse nesting habitat as determined during on-site reviews of proposed development areas. In addition, if an active sage grouse nest is identified in an area proposed for disturbance, surface-disturbing activities will be

delayed in the area until nesting is completed, and proposed disturbance areas will be relocated, where possible, to avoid nest locations.

D-2.3.4 Big Game Species

No construction activities or extensive maintenance actions (e.g., workovers) will be conducted within big game crucial winter range on the CD/WIIPA during crucial winter periods (i.e., November 15 - April 30). No road or pipeline ROW fencing is proposed for the project; however, if ROW fencing is required, it will be kept to a minimum, and the fences will meet BLM/WGFD approval for facilitating wildlife movement.

Wildlife-proof fencing will be used only to enclose reclaimed areas where it is determined that wildlife species are impeding successful vegetation establishment. Snowfences, if used, will be limited to segments of 0.25 mi or less. Project personnel will also be advised to minimize stopping and exiting their vehicles in big game winter habitat while there is snow on the ground. In addition, escape openings will be provided along roads in big game crucial

winter ranges as designated by the BLM to facilitate exit of big game animals from snowplowed roads.

Additional habitat protection/improvement measures may also be applied in any given year as directed by the BLM, in consultation with Operators and other agencies, and specified in annual wildlife reports.

Potential increases in poaching will be minimized through employee and contractor education regarding wildlife laws (see Section D-2.1.2). If violations are discovered on the CD/WIIPA, Operators will immediately notify the BLM, and if the violation is committed by an employee or contractor, said employee or contractor will be disciplined and may be dismissed by the Operator and/or prosecuted by the WGFD and/or USFWS.

D-2.3.5 General Wildlife

Unless otherwise indicated, the following protection measures will be applied for all wildlife species.

Additional measures primarily designed to minimize impacts to other CD/WIIPA resources (e.g., vegetation and surface water resources, including wetlands, steep slopes, etc.) are identified in EIS Section 2.6.13 and Chapter 4.0, and these measures may provide additional protection for area wildlife. Additional actions may be applied in any given year to further minimize potential impacts to wildlife. These actions will be specified in annual reports.

All roads on and adjacent to the CD/WIIPA that are required for the proposed project will be appropriately constructed, improved, maintained, and signed to minimize potential wildlife/vehicle collisions and facilitate wildlife (most notably big game) movement through the CD/WIIPA. Appropriate speed limits will be adhered to on all CD/WIIPA roads, and Operators will advise employees and contractors regarding these speed limits. Some existing roads on the CD/WIIPA and surrounding transportation planning area may be reclaimed if they become redundant or closed (gated and locked) to deny unnecessary access during critical winter periods.

To protect important habitat in southwestern portions of the CD/WIIPA (i.e., ephemeral draws dominated by basin big sagebrush) areas with sagebrush greater than 3 ft tall will be avoided where possible.

Additional non-species-specific wildlife mitigations include the following.

- Reserve, workover, and flare pits and other locations potentially hazardous to wildlife will be adequately protected by netting and/or fencing as directed by the BLM to prohibit wildlife access.
 - No surface water or shallow ground water in connection with surface water will be utilized for the proposed project.
 - If dead or injured raptors, big game, migratory birds, or unusual wildlife are observed on the CD/WIIPA, Operator personnel will contact the appropriate BLM and WGFD offices. Under
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- no circumstances will dead or injured wildlife be approached or handled by Operator personnel.
- Operators will implement policies designed to control poaching and littering and will notify all employees (contract and company) that conviction of a major violation could result in disciplinary action. Contractors will be informed that any intentional game law violation or littering within the CD/WIIPA could result in dismissal.

In the event that four or more locations occur on a section, further project_specific wildlife protection measures may be applied. These measures may include the installation of remote well monitoring devices at well locations to avoid unnecessary visits by Operator personnel and the installation of water and/or condensate pipelines from well locations to central processing facilities to avoid repeated trucking of condensate and water from these well locations. Additional project_ and site-specific measures may be added in future years as specified in annual reports.

D-3.0 LITERATURE CITED

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ADDENDUM D-A:
EXAMPLE DATA SUMMARY TABLES

Table D-A.1 Summary of Raptor Nest Data, Continental Divide/Wamsutter II Natural Gas Project, Carbon and Sweetwater Counties, Wyoming, 1999.

[illegible]

Table D-A.2 Summary of Observations of Threatened, Endangered, Candidate, and Other Species of Concern, Continental Divide/Wamsutter II Natural Gas Project, Carbon and Sweetwater Counties, Wyoming, 1999.

[illegible]

¹ Indicates presence/absence. BS = Big sagebrush R = Reclaimed
SB = Saltbush D = Disturbed
MR = Mixed grassland UP = Unvegetated playa
B/R = Basin/exposed rock (Badland) SR = Shrub-dominated riparian
BG = Black greasewood P/R = Pond/riparian
DS = Desert shrub

Table D-A.3 Summary of Sage Grouse Lek Data, Continental Divide/Wamsutter II Natural Gas Project, Carbon and Sweetwater Counties, Wyoming, 1999.

[illegible]

Table D-A.4 Summary of General Wildlife Observations, Continental Divide/Wamsutter II Natural Gas Project, Carbon and Sweetwater Counties, Wyoming, 1999.

Species		No. of	Habitat Type ¹										No. of Obs. by Season ²				
		Obs.	BS	SB	MG	B/R	GW	DS	R	D	UP	SR	P/R	Winter	Spring	Summer	Fall
C o m m o n Name	Scientific Name																
Mammals																	
Total																	
Birds																	
Total																	
Reptiles /Amphibians																	
Total																	
Grand Total																	

¹ Indicates presence/absence.

BS = Big sagebrush
 SB = Saltbush
 MG = Mixed grassland
 B/R = Basin/exposed rock (badland)
 GW = Greasewood
 DS = Desert shrub
 R = Reclaimed
 D = Disturbed
 UP = Unvegetated playa
 SR = Shrub-dominated riparian
 P/R = Pond/riparian

² Seasons are defined as follows:
 Summer = June-August
 Fall = September-October

Winter = November-March
 Spring = April-May

ADDENDUM D-B:
EXAMPLE DATA SUMMARY FORMS

GENERAL WILDLIFE OBSERVATION DATA SHEET

Month/year_____ Observer_____ Type of survey_____

Page ____ of ____

Notes _____

[illegible]

¹ Circle any uncertain data (i.e., partial counts, uncertain age or sex) or note as unknown.

RAPTOR NESTING RECORD

Page_ of _

Nest Number_____ Location_____ Habitat Type_____

Map Location

Date first observed_____

Initial observer_____

Nest type_____

Nest material_____

Substrate_____

Rim/tree height (m)_____

Nest height above ground level (m)_____

Elevation_____

Nest exposure_____

Comments_____

USGS Quad_____

Date	Status	Species	# adults	# eggs	# young	Observer	Comments (condition, activity of individuals, etc.)

A photo of the nest location may be provided on reverse.

RAPTOR OBSERVATION DATA SHEET

Month/year _____ Observer _____ Type of survey _____

Page ____ of ____

Notes _____

[illegible]

¹ Circle any uncertain data (i.e., partial counts, uncertain age or sex) or note as unknown.

SAGE GROUSE LEK RECORD

Page_ of _

Lek Number _____ Location _____ Habitat Type _____

Map Location

Date first observed _____

Initial observer _____

Slope/topography_____

Elevation _____

Lek exposure_____

Comments _____

USGS Quad _____

[illegible]

APPENDIX E:
BIOLOGICAL ASSESSMENT

Modifications to this plan have been made pursuant to the U.S. Fish and Wildlife Service Biological Opinion and associated implementation protocol (Appendix G) and including Wyoming Bureau of Land Management Instruction Memorandum No. WY-2000-44 (Appendix I).

**BIOLOGICAL ASSESSMENT FOR THE
CONTINENTAL DIVIDE/WAMSUTTER II NATURAL GAS PROJECT
THREATENED, ENDANGERED, CANDIDATE,
AND SPECIES OF SPECIAL CONCERN**

Prepared for

**U.S. Bureau of Land Management
Rawlins Field Office
Rawlins, Wyoming**

and

**Rock Springs Field Office
Rock Springs, Wyoming**

By

**TRC Mariah Associates Inc.
Laramie, Wyoming
MAI Project 1295**

April 1999

ABBREVIATIONS AND ACRONYMS

APD	Application for Permit to Drill
APLIC	Avian Power Line Interaction Committee
BA	Biological Assessment
BFF	Black-footed ferret
BLM	Bureau of Land Management
CD/WIIPA	Continental Divide/Wamsutter II Project Area
CNHP	Colorado Natural Heritage Program
dba	A-weighted decibel(s)
DEIS	Draft Environmental Impact Statement
EIS	Environmental impact statement
ESA	<i>Endangered Species Act of 1973</i> , as amended
FREP	Ferret Recovery Enhancement Program
ft	Foot or feet
GCIAA	General Cumulative Impact Assessment Area
GDRA	Great Divide Resource Area
GRRA	Green River Resource Area
IDT	Interdisciplinary Team
LOP	Life-of-project
mi	Mile(s)
mm	Millimeter(s)
NEPA	<i>National Environmental Policy Act of 1969</i>
Operators	Amoco Production Company, Union Pacific Resources Company, Snyder Oil Corporation, Yates Petroleum, and other companies
RFO	Rawlins Field Office
RMP	Resource Management Plan
ROW	Right-of-way
RSFO	Rock Springs Field Office
SRA	Sensitive Resource Area
TEC&SC	Threatened, endangered, candidate, and other species of special concern
USDI	U.S. Department of the Interior
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management
WGFD	Wyoming Game and Fish Department
WNDDDB	Wyoming Natural Diversity Database
WOS	Wildlife Observation System
WSA	Wilderness Study Area

E-1.0 INTRODUCTION

In addition, this BA presents requirements to assure that the construction and subsequent operation of the proposed project on federal lands would neither jeopardize the continued existence of these species nor result in the destruction or adverse modification of their critical habitats. Analysis of effects of this proposed project on federally listed TEC&SC ensures compliance with the provisions of the *Endangered Species Act of 1973* (ESA), P.L. 93-205 (87 Stat. 884), as amended.

TEC&SC are those that have been specifically designated as such by the U.S. Fish and Wildlife Service (USFWS). Threatened species are those that are likely to become endangered in the foreseeable future throughout all or a significant portion of their ranges. Endangered species are those that are in danger of extinction throughout all or a significant portion of their ranges. Candidate species (former Category 1 candidate species) are those for which the USFWS has sufficient data to list as threatened or endangered, but for which proposed rules have not yet been issued. Species of special concern (former Category 2 candidate species) are those that may warrant designation as candidate species but sufficient data are not currently available for such a designation decision; these species are also referred to as "special status species" by the Bureau of Land Management (BLM) and "species at risk" by the USFWS (USFWS 1995a).

Critical habitat for a threatened or endangered species includes: 1) specific locations within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of Section 4 of the ESA, on which are found those physical or biological features (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and 2) specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination by the Secretary (i.e., Interior, Commerce, or Agriculture) that such areas are essential for the conservation of the species. There currently is no designated critical habitat for any threatened or endangered species in the CD/WIIPA.

Table E-1.1 Threatened, Endangered, Candidate, and Other Species of Special Concern and Their Potential for Occurrence on the CD/WIIPA, Sweetwater and Carbon Counties, Wyoming, 1999.¹

Species		Federal Status ²	Potential Occurrence on CD/WIIPA ³
Common Name	Scientific Name		
MAMMALS			
Black-footed ferret	<i>Mustela nigripes</i>	E	X
Long-eared myotis (bat)	<i>Myotis evotis</i>	SS	R
Long-legged myotis (bat)	<i>Myotis volans</i>	SS	R
Pale Townsend*s big-eared bat	<i>Plecotus townsendii pallescens</i>	SS	U
Pygmy rabbit	<i>Brachylagus idahoensis</i>	SS	X
Small-footed myotis (bat)	<i>Myotis ciliolabrum</i>	SS	U
Swift fox	<i>Vulpes velox</i>	C	U
BIRDS			
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	U
Black tern	<i>Chlidonias niger</i>	SS	U
Columbian sharp-tailed grouse	<i>Tympanuchus columbianus phasianellus</i>	SS	X
Ferruginous hawk	<i>Buteo regalis</i>	SS	C
Loggerhead shrike	<i>Lanius ludovicianus</i>	SS	C
Mountain plover	<i>Charadrius montanus</i>	Proposed as T	C
Northern goshawk	<i>Accipiter gentilis</i>	SS	R
Peregrine falcon	<i>Falco peregrinus</i>	E	R
Trumpeter swan	<i>Cygnus buccinator</i>	SS	R
Western burrowing owl	<i>Athene cunicularia hypugea</i>	SS	U
White-faced ibis	<i>Plegadis chihi</i>	SS	U
REPTILES			
Eastern short-horned lizard	<i>Phrynosoma douglassii brevirostra</i>	SS	C
FISH			
Bonytail chub	<i>Gila elegans</i>	E	X, DC
Colorado squawfish	<i>Ptychocheilus lucius</i>	E	X, DC

Flannelmouth sucker	<i>Catostomus latipinnis</i>	SS	X, DL, DC
Humpback chub	<i>Gila cypha</i>	E	X, DC
Razorback sucker	<i>Xyrauchen texanus</i>	E	X, DC
Roundtail chub	<i>Gila robusta</i>	SS	X , D L , DCPLANTS
Big Piney milkvetch	<i>Astragalus drabelliformis</i>	SS	Unlikely
Cedar Rim thistle	<i>Cirsium aridum</i>	SS	Possible
Devil*s gate twinpod	<i>Physaria eburniflora</i>	SS	Unlikely
Gibben's beardtongue	<i>Penstemon gibbensii</i>	SS	Unlikely
Large-fruited bladderpod	<i>Lesquerella macrocarpa</i>	SS	Possible
Mystery wormwood	<i>Artemisia biennis</i> var. <i>diffusa</i>	SS	Possible
Opal phlox	<i>Phlox opalensis</i>	SS	Possible
Ownbey*s thistle	<i>Cirsium ownbeyi</i>	SS	Unlikely
Tufted twinpod	<i>Physaria condensata</i>	SS	Unlikely
Utes ladies' tresses	<i>Spiranthes diluvialis</i>	T	Unlikely
Wyoming tansymustard	<i>Descurainia torulosa</i>	SS	Possible

¹ Adapted from personal communications with USFWS, Wyoming Game and Fish Department (1995), Wyoming Natural Diversity Data Base (1995, 1996, 1997), and Fertig et al. (1994).

² Federal status:

E = Endangered

Threatened

Candidate (proposed threatened)

Special Status Species (BLM-managed, former USFWS category 2 candidate species)

³ Species occurrence:

Commonly common; species could occur in abundant numbers, but only in widely scattered or isolated populations. Populations or individuals probably would be encountered during construction and field operation, but only at a limited number of sites. Species could be present for a significant part of the year (e.g., breeding season, summer resident) or the entire year.

Uncommon; species may be present in the project area, but in such low numbers or in such small and widely scattered populations that an encounter during construction and field operation is unlikely. The species could be present for a significant part of the year (e.g., breeding season, summer resident) or the entire year.

Rare; species may occur in the project area for just a few days or hours (e.g., stopping over during migration), or the species has only occasionally or rarely been sighted in the project area. Encounters during construction and field operation are very unlikely.

Not probable; there has been no recent historical record of the species' occurrence in the project area; probability of encountering the species during construction and field operation is extremely unlikely.

~~DL~~ Downstream resident of Colorado River System.

DL = Downstream resident of Little Snake River.

Possible = Species documented in the general vicinity of the CD/WIIPA, but not within the CD/WIIPA itself.

Unlikely= Species documented in areas relatively distant from the CD/WIIPA and/or in habitats unlikely to be present within the CD/WIIPA.

E-2.0 PROJECT DESCRIPTION

Operators propose to expand natural gas exploration and development in and adjacent to other oil and gas developments including the Greater Wamsutter Area II, Creston/Blue Gap Area, and the Mulligan Draw Area. The proposed CD/WIIPA is located approximately 25mi west of Rawlins and 40 mi east of Rock Springs along Interstate 80, which bisects the area east to west (see Map 1.1 in the EIS). The CD/WIIPA is located generally within Townships 15 through 23 North and Ranges 91 through 99 West in Sweetwater and Carbon Counties, Wyoming. The 1,061,200-acre CD/WIIPA primarily occurs within the checkerboard land pattern that resulted from early railroad grants made by the federal government to the Union Pacific Railroad Company and includes 531,400 acres of federal land, 9,800 acres of state land, and 520,000 acres of private land. The entire CD/WIIPA is included in the analysis for this BA since development on private and state lands will likely occur in association with federal land development. The proposed project is located on lands administered by the BLM Rawlins Field Office (RFO) and Rock Springs Field Office (RSFO).

Four development scenarios are analyzed in the EIS and in this BA:

- the Proposed Action (full field development);
- Alternative A (14-acre maximum surface disturbance per federally managed section in sensitive resource areas [SRAs]) (see Map 2.3 in EIS);
- Alternative B (30-acres maximum surface disturbance per federally managed section in SRAs); and
- the No Action Alternative.

SRAs were defined during preparation of the EIS by the BLM Interdisciplinary Team (IDT) based on public and agency concerns identified during scoping and during past environmental analyses conducted in the region. SRAs include areas with stabilized sand dunes, raptor nesting concentration areas, probable sage grouse nesting areas (i.e., areas within 2.0 mi of sage grouse leks), crucial big game winter ranges, areas proximal to residential areas, Visual Resource Management Class II areas, and areas with high densities of cultural resource sites.

The project entails the development of natural gas resources in the CD/WIIPA beginning in 1999 and continuing for approximately 20 years. Well densities will vary across the CD/WIIPA and will likely range from 640 acres/well to 80 acres/well (1 to 8 wells per section) for production in areas found to be highly productive. Alternatives involving project-wide spacing patterns, the drilling and development of varying numbers of wells, the exclusion of development on all public lands in the CD/WIIPA, and developments on and adjacent to the Adobe Town Wilderness Study Area were considered but rejected for economic, environmental, and/or legal reasons.

Summary descriptions of the four alternatives are presented below; specific details of construction and production activities can be found in the EIS. Project documents and other information are located at the BLM GRRA Office in Rock Springs, Wyoming, and the GDRA Office in Rawlins, Wyoming.

E-2.1 THE PROPOSED ACTION - FULL FIELD DEVELOPMENT (3,000 WELL LOCATIONS)

Definitive predictions on the total number of wells and the timing of drilling operations are not currently possible due to the lack of natural gas exploration in much of the CD/WIIPA; however, the BLM's Reservoir Management Group and the Operators have indicated that a maximum of 3,000 wells at 3,000 well locations may be developed in the CD/WIIPA (approximately 1,500 wells or well locations on federal lands and/or

federal mineral estate). Operators anticipate that fewer wells or well locations would be necessary, and in the event fewer locations are developed, decreased impacts are expected. Drilling and development would begin in 1999 and continue for approximately 20 years, with a life-of-project (LOP) of 30-50 years. Various associated facilities (e.g., roads, pipelines, power lines, water wells, disposal wells, evaporation ponds, compressor stations, gas processing facility) would also be constructed.

The Proposed Action would result in a maximum of 7,800 acres of new surface disturbance from well locations (including on-site gathering, measurement, and dehydration facilities); 1,500 mi (10,000 acres) of new roads or upgrades of existing roads; 1,500 mi (4,500 acres) of new pipeline; and approximately 100 acres of new surface disturbance from ancillary facilities (e.g., compressor stations, water disposal sites) (see Table 2.1 in EIS). Total new short-term and LOP surface disturbance resulting from the Proposed Action would be 22,400 acres and 8,300 acres, respectively. With the inclusion of existing disturbance necessary for the Proposed Action, total new short-term and LOP surface disturbance would be 33,600 acres and 15,900 acres, respectively. Total project-required new and LOP surface disturbance on federal lands and/or mineral estate in the CD/WIIPA is estimated to be approximately 50% of the total CD/WIIPA surface disturbance or 16,800 acres and 7,950 acres, respectively.

E-2.2 ALTERNATIVE A - 14-ACRE MAXIMUM SURFACE DISTURBANCE PER FEDERALLY MANAGED SECTION IN SRAs

Surface disturbance throughout the entire CD/WIIPA resulting from Alternative A would be similar to that from the Proposed Action, except that long-term LOP surface disturbance and associated impacts would likely be reduced on federal lands in SRAs (see Table 2.2 in the EIS). It is assumed that reductions in the level of LOP surface disturbance would result in reductions in overall disturbance (both direct and indirect) to most sensitive resources. Approximately 47% of the CD/WIIPA is within SRAs (see Map 2.3 in the EIS), and under Alternative A, a maximum of 14 acres of surface disturbance would be allowed at any one time on any federally managed section (surface and/or mineral estate) within SRAs. The 14-acre maximum surface disturbance criteria was developed by the BLM based on public, agency, and resource specialist concerns regarding potential impacts to sensitive resources from natural gas field developments. The 14-acre criteria would allow Operators to explore for natural gas throughout the entire CD/WIIPA, but would require notable changes in operational procedures for field developments within SRAs. Under this alternative, Operators would be able to explore their leases within SRAs (e.g., one well location per section) and to develop a limited number of additional locations (e.g., from one to three) depending upon the extent of new surface disturbance and associated reclamation status (see Table 2.2 in the EIS).

Surface disturbance limitation requirements would apply to all future oil and gas development activities conducted on federal lands in SRAs. To accommodate surface disturbance limitation requirements, Operators may limit surface disturbance through:

- operational changes (e.g., directional drilling; multiple wells per pad; modified location, road, pipeline, and/or ancillary facility design; use of surface pipelines; delaying construction/drilling operations until all unnecessary project-required federal surface disturbances are reclaimed);
- selection of alternative locations for ancillary facilities (e.g., outside SRAs or off federal surface); and/or
- reclamation of unnecessary existing surface disturbance on their lease (e.g., two-track roads).

The BLM, in consultation with other appropriate individuals, agencies, and land user groups (e.g., permittees, Wyoming Game and Fish Department [WGFD], USFWS), may modify surface disturbance limitation requirements if the Operators can show that alternative operational procedures would provide greater protection for sensitive resources than would limiting surface disturbance. For example, the use of pipeline

collection/distribution systems for condensate, drilling water, and/or produced water, which would temporarily increase overall ground surface disturbance, may in some instances be preferable since their use could result in a decrease in the level of human activity along access roads and at well locations; thereby reducing indirect impacts associated with animal displacement. In addition, remote sensing devices could be installed at well locations to further reduce human activity levels.

Total new area-wide short-term surface disturbance for this alternative could be the same as for the Proposed Action. However, total maximum long-term (LOP) disturbance on federally managed sections in SRAs would be reduced (see Table 2.2 in the EIS), since newly disturbed areas must be reclaimed prior to the initiation of further surface disturbing activities. Some increase in the extent of surface disturbance on private or state lands within SRAs and on federally managed lands outside of SRAs would likely occur under this alternative.

E-2.3 ALTERNATIVE B - 30-ACRE MAXIMUM SURFACE DISTURBANCE PER FEDERALLY MANAGED SECTION IN SENSITIVE RESOURCE AREAS

Area-wide surface disturbance resulting from Alternative B would be similar to that for the Proposed Action and Alternative A, except that surface disturbance and associated impacts would likely be increased on federal lands in SRAs from that occurring under Alternative A and reduced from that occurring under the Proposed Action (see Table 2.2 in the EIS). Maximum new surface disturbance per federal section would be limited to 30 acres at any one time within SRAs. The 30-acre maximum surface disturbance limitation was developed via the same means as that described for Alternative A and allows Operators to develop natural gas resources within SRAs at a level intermediate between Alternative A and the Proposed Action. Under this alternative, Operators would be able to explore and conduct limited development of their leases within SRAs (e.g., from two to eight locations per section) depending upon the extent of new surface disturbance and associated reclamation status (see Table 2.2 in the EIS). To protect federal natural gas reserves within SRAs from drainage, these reserves may be developed regardless of reclamation status.

Total new short- and long-term surface disturbance throughout the CD/WIIPA under this alternative could be the same as that for the Proposed Action; however, there would likely be reductions in the level of long-term surface disturbance on federally managed lands in SRAs. Some increase in the extent of surface disturbance on private or state lands within SRAs and on federally managed lands outside of SRAs would likely occur under this alternative.

E-2.4 NO ACTION

A No Action Alternative must be considered in all *National Environmental Policy Act of 1969* (NEPA) documents. Under the No Action Alternative, the BLM would deny further natural gas development on federal lands in the CD/WIIPA as currently proposed by the Operators. Denial of the current development proposal is not, however, a denial of all natural gas development in the area. Development of lands in the CD/WIIPA likely would occur at levels similar to those that have occurred on the area in the past and would occur as authorized by existing management directives contained in RMPs. Site-specific NEPA analyses would be conducted for all development activities on public lands or mineral estates.

For the purpose of this analysis, the No Action Alternative assumes that lands in the CD/WIIPA would be developed for natural gas production at approximately the same rate as has occurred previously. This assumption is highly speculative, since all federal lands within the CD/WIIPA have been leased for oil and gas production or are available for lease, the area is rated as suitable for gas production in the GRR and GDRA RMPs, and accelerated development of the area has been proposed. The selection of the No Action Alternative in the EIS would not preclude natural gas development in the area.

An estimated 845 well locations would be built, 422mi of road would be constructed or upgraded, 422 mi of pipeline would be laid, and 100 acres of new surface disturbance would be required for ancillary facilities, resulting in a maximum of 6,400 acres of new surface disturbance and 2,400 acres of long-term surface disturbance (see Table 2.1 in the EIS). With the inclusion of all existing surface disturbances on the CD/WIIPA, total new and long-term surface disturbance under the No Action Alternative would be 24,800 acres and 17,200 acres, respectively, and it is estimated that approximately 50% of this disturbance would be on federally managed lands.

Most leases in the CD/WIIPA contain various stipulations addressing surface disturbance, steep slopes, wildlife, and other matters of concern. These stipulations would allow the BLM to preclude development in certain areas (e.g., where slopes exceed 25%) or at certain times of the year (e.g., to protect big game crucial winter habitat) if operations cannot be acceptably mitigated. However, there is no stipulation, such as a No Surface Occupancy stipulation, that would allow the BLM to preclude drilling operations everywhere on a lease at all times of the year. If any one of the stipulations cannot be acceptably implemented and impacts mitigated, than an exception would not be granted. A decision, therefore, of no action, as authorized by the leases, would only be considered, given one of the following conditions.

- If there were no acceptable means of mitigating significant adverse impacts to stipulated surface resource values, then this would trigger denial of the Application for Permit to Drill (APD) and require consideration and analysis of another alternative(s). Effectively, exception(s) to one or more of the lease stipulations would not be approved.
- If the USFWS concluded that the Proposed Action and alternatives would likely jeopardize the continued existence of threatened or endangered plant and animal species, then the APD and lease development may be denied in whole or in part.

This BA will help to determine whether the proposed project meets the second condition.

E-3.0 METHODS

A list of TEC&SC animal and plant species that potentially occur on or adjacent to the project area and associated GCIAA (see Map 4.1 in the EIS) was compiled from several sources, including a letter from the Wyoming State Supervisor's Office of the USFWS (1995b, 1997), the WGFD Wildlife Observation System (WOS) records (WGFD 1995), the Nature Conservancy's Wyoming Natural Diversity Database (WNDDDB) (1995, 1996, 1997), and the Nature Conservancy's Colorado Natural Heritage Program (CNHP) (1995). All TEC&SC species in the region are discussed in Chapter E-6.0 of this BA.

Information pertaining to the listed TEC&SC animal and plant species was gathered from the above sources and from published literature. Further site-specific information pertaining to these species will be gathered as part of APD and right-of-way (ROW) application processes, and the potential impact of a given construction site on a particular species will be determined as part of APD and ROW application reviews. The purpose of this BA is to provide a project-wide assessment of potential impacts to the listed TEC&SC species.

E-4.0 PROJECT-WIDE MITIGATION MEASURES FOR TEC&SC SPECIES

This section provides some of the measures that will be utilized to avoid, minimize, or mitigate potential impacts to TEC&SC species associated with implementation of the proposed CD/WIIPA. Additional environmental protection measures designed specifically for other resources present on the area (e.g., soils, vegetation, wetlands, visual resources) are given in Section 2.6.13 of the EIS. These measures apply to both the Proposed Action and the two development alternatives. Project-wide mitigation measures may be waived on a case-by-case basis by the BLM if a thorough analysis determines that the resource(s) for which the measure was developed will not be impacted. Further site-specific mitigation measures will be identified during APD and ROW application review processes. To ensure compliance with mitigation measures presented in this BA and in APDs and ROW applications, each Operator will provide a qualified individual available during construction/drilling operations. This individual will consult with the BLM on a case_by_case basis as necessary during field development.

All of the proposed applicant-committed mitigation/environmental protection measures identified in Section E-4.1 will be implemented on all federal lands under all alternatives except No Action. Implementation of these measures on state and private lands will be subject to landowner preferences and agreements with individual Operators, and where these measures are not implemented, additional impacts/adverse effects could occur. Development activities on all lands, including those implemented under No Action, will be conducted in accordance with all appropriate federal, state, and county laws, rules, and regulations. General mitigation measures for TEC&SC species on the CD/WIIPA are presented below.

E-4.1 APPLICANT-COMMITTED MEASURES

1. Well locations, access roads, pipelines, and ancillary facilities will be selected and designed to minimize disturbances to areas of high wildlife habitat value (e.g., prairie dog colonies, cushion plant communities, playa lakes, wetlands and riparian areas).
 2. Areas with high erosion potential and/or rugged topography (i.e., steep slopes [$>25\%$], stabilized sand dunes, floodplains, erosive and sandy soils) will be avoided, where possible, or specialized mitigation measures will be applied.
 3. All Operator-constructed roads not required for routine operation and maintenance of producing wells or ancillary facilities will be reclaimed as directed by the BLM, State Land Board, or private landowner. As necessary, these roads will be permanently blocked, recontoured, reclaimed, and revegetated by Operators, as will disturbed areas associated with permanently plugged and abandoned wells.
 4. Removal or disturbance of vegetation will be minimized through construction site management (e.g., by utilizing previously disturbed areas, using existing ROWs, designating limited equipment/materials storage yards and staging areas, scalping, etc.).
 5. Reserve, workover, and evaporation/production pits potentially hazardous to wildlife will be adequately protected (e.g., netted, fenced) to prohibit wildlife access as directed by the BLM, to ensure protection of migratory birds and other wildlife.
 6. Any power line construction will follow recommendations by Avian Power Line Interaction Committee (APLIC) (1994, 1996) and Olendorff et al. (1981) to avoid collisions and electrocution of raptors and other avifauna.
 7. USFWS and WGFD consultation and coordination will be conducted as necessary for all mitigation activities related to raptors and TEC&SC species (and their habitats), and all permits required for movement, removal, and/or establishment of raptor nests will be obtained.
 8. Proposed disturbance within 1.0 mi of identified raptor nests will be surveyed by a qualified biologist to determine activity status prior to commencement of drilling and construction during raptor nesting
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periods. If an active raptor nest is identified within 0.25 mi to 1.0 mi (depending upon species and line of sight) of a proposed disturbance site, Operators will restrict construction during the nesting season for that species. Additional mitigations for nesting raptors will be designed on a site-specific basis, as necessary, in consultation with the BLM, USFWS, and WGFD. Operators will notify the BLM immediately if raptors are found nesting on project facilities and will assist the BLM as necessary in erecting artificial nesting structures.

9. Operators will internally enforce existing drug, alcohol, and firearms policies.
 10. All production facilities (e.g., compressors) will be muffled and maintained to minimize noise levels.
 11. To minimize wildlife mortality due to vehicle collisions, Operators will advise project personnel regarding appropriate speed limits on the CD/WIIPA.
 12. To protect plant populations and wildlife habitat, project-related travel will be restricted to established project roads; no off-road travel will be allowed.
 13. Potential impacts to fisheries will be minimized by using proper erosion control techniques (e.g., water bars, jute netting, rip-rap, mulch). Construction within 500 ft of open water and 100 ft of intermittent or ephemeral channels will be avoided, where possible, and stream crossings for roads and pipelines will be constructed during the period of lowest flow (i.e., late summer or fall). All required stream crossings will be constructed perpendicular to flow, where possible. No surface water or shallow ground waters in connection with surface waters will be utilized for the proposed project (see EIS Section 4.1.7.1).
 14. Operators will finance site-specific surveys for TEC&SC plant species prior to any surface disturbance in areas determined by the BLM to contain potential habitat for such species (BLM Directive 6840). These surveys will be completed by a qualified botanist as authorized by the BLM, and this botanist will be subject to BLM's special status plant survey policy requirements. Data from these surveys will be provided to the BLM, and if any TEC&SC plant species or their habitats are found, BLM recommendations for avoidance or mitigation will be implemented. Minor relocation of project facilities will be made to avoid TEC&SC plant species and/or their habitat. If avoidance is not possible, informal consultation with the USFWS will be initiated, as necessary.
 15. Herbicide applications will be kept at least 500 ft from known TEC&SC plant populations.
 16. Site-specific surveys for TEC&SC animal species will be conducted prior to disturbance in areas determined by the BLM to contain potential habitat for such species. These surveys will be completed by the BLM and/or BLM-authorized biologist during on-site inspections of proposed ROWs and well locations prior to disturbance. Surveys will focus on those TEC&SC animal species known to occur on the CD/WIIPA, as well as those potentially occurring in the area. Data from these surveys will be provided to the BLM. If TEC&SC animal species or their habitats are found on the area, construction activities will be delayed and the BLM, USFWS, and WGFD will be consulted to determine appropriate avoidance and/or protection measures. Habitats where TEC&SC animal species are likely or are known to occur will be avoided where possible through minor relocations of project facilities. If avoidance is not possible, informal consultation with the USFWS will be initiated as necessary.
 17. Mountain plover habitats (e.g., cushion plant communities, playa lakes, areas with vegetation <4 inches in height) will be avoided, where practical, and where these habitats will be disturbed, reclamation will utilize procedures designed to re-establish suitable plover habitat. Furthermore, mountain plover surveys will be conducted within suitable plover habitat on the CD/WIIPA by a qualified biologist in accordance with USFWS guidelines and as directed by the BLM. The survey procedures will include the following.
 - Visual observation of areas within 656ft (200 meters) of proposed disturbance will be made from stationary vehicles and/or all terrain vehicles to detect the presence of plovers. All plovers located will be observed long enough to determine if a nest is present.
 - Surveys will be conducted no more than 14 days prior to the date actual ground-disturbing
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activities begin. If two surveys are required, they will be made at least 14 days apart, with the last survey no more than 14 days prior to the start-up date.

- The number of surveys required to clear a site for mountain plovers prior to beginning a planned activity depends on the start-up date, as shown below.

<u>Date of Planned Activity</u>	<u># Surveys Required</u>
March 15 - March 31	1
April 1 - June 30	2
July 1 - August 15	1

- Surveys will be required by the BLM to clear an action for mountain plovers prior to beginning a planned activity, and surveys would be conducted during the period of April 15-June 30 for development activities planned during this period.
 - Road construction and maintenance (i.e., grading) activities will be minimized from May 25 to June 30.
 - Where practical, no new surface-disturbing activities will be conducted from April 1 to June 30 within 656 ft (200 m) of identified mountain plover concentration areas (i.e., areas where broods and/or adults have been observed in the current year or documented in at least 2 of the past 3 years).
 - Where access roads and/or well locations have been constructed prior to the mountain plover nesting season and use of these areas has not been initiated for development actions, the BLM will require site investigations of these disturbed areas prior to use to determine whether mountain plover are present. In the event mountain plover nesting is occurring, the BLM may require delays in development activities until nesting is complete.
18. Prairie dog colonies that meet black-footed ferret habitat size and burrow density criteria (USFWS 1989) will be avoided where practical.
 19. Where prairie dog colonies will be disturbed, Operators would consult with the USFWS and/or the BLM and BLM would initiate informal consultation with the USFWS to determine if black-footed ferret searches are required. If ferret searches are required, they will be conducted no more than 12 months prior to construction by Operator-financed USFWS-approved biologists pursuant to USFWS guidelines (USFWS 1989).
 20. All wildlife inventory, monitoring, and protection measures specified in the Wildlife Protection Plan (see EIS AppendixD) will be implemented.

E-4.2 ADDITIONAL BLM-REQUIRED MEASURES

Pursuant to Instruction Memorandum No. WY-99-24, the BLM will implement or require further protection measures for TEC&SC species as shown in Table E-4.1. Additionally, the BLM may recommend that the Wyoming Oil and Gas Conservation Commission and State Land Board adopt policies to ensure ESA compliance during well permitting on state and private lands.

Table E-4.1 BLM Requirements for Inventory, Monitoring, and Protection of Threatened, Endangered, Candidate, and Species of Special Concern, Continental Divide/ WamsutterII Natural Gas Project, Sweetwater and Carbon Counties, Wyoming, 1999.

Land Status	BLM Requirements ¹
BLM surface/BLM subsurface	Conduct data gathering and avoid or mitigate impacts as appropriate.
BLM surface/non-BLM subsurface	Conduct data gathering and avoid or mitigate impacts as appropriate.
Non-BLM surface/BLM subsurface ²	Request landowner permission to access lands for inventory and, if granted, conduct data gathering on affected areas and require avoidance or mitigation of impacts, as appropriate. If permission is not granted, the BLM will require Operators to obtain access through appropriate legal action and, if obtained, conduct data gathering on affected areas and avoid or mitigate impacts, as appropriate. If legal access is not obtained, no on_site data gathering will be conducted, and all analyses will be done using alternate methods and so stated in the appropriate analysis document. If it is suspected that TEC&SC species or their critical habitats may be affected, the USFWS will be notified.
Non-BLM surface/non-BLM subsurface and non_BLM surface/BLM subsurface ³	Request landowner permission to access lands for inventory and, if granted, conduct data gathering on affected areas and require avoidance or mitigation of impacts, as appropriate. If permission is not granted, no on_site data gathering will be conducted and all analyses will be done using alternate methods and so stated in the appropriate analysis document. If it is suspected that TEC&SC species or their critical habitats may be affected, the USFWS will be notified.

¹ The BLM may also require Operators to obtain appropriate TEC&SC species resource data.

² For actions that are a direct result of the subsurface estate value (e.g., oil and gas exploration and development).

³ For actions that are not a direct result of the subsurface estate (e.g., ROWs).

E-5.0 SPECIES ACCOUNTS

This chapter presents a discussion of the status, habitat, potential effects, and mitigation for TEC&SC animal and plant species that may occur in the CD/WIIPA and surrounding area. A summary of the potential effects and mitigations is presented in Table 5.1. Further detail on project and cumulative impacts to vegetation and wildlife is provided in EIS Sections 4.2.1, 4.2.2, 4.2.3, and 4.2.5.

E-5.1 MAMMALS

E-5.1.1 Black-footed Ferret

E-5.1.1.1 Current Status and Habitat Use

The black-footed ferret (BFF), a federal endangered species, was once distributed throughout the high plains of the Rocky Mountain and western Great Plains regions (Forrest et al. 1985). Prairie dogs are the main food of BFFs (Sheets et al. 1972), and few BFFs have been historically collected away from prairie dog colonies (Forrest et al. 1985). BFFs were considered extinct until a small population was discovered near Meeteetse, Wyoming, in 1981. Following outbreaks of distemper, surviving BFFs were brought into captivity and a captive breeding program was initiated (USFWS 1988). BFFs were reintroduced in the Shirley Basin of central Wyoming in 1991; this reintroduction effort continues with the aid of annual supplemental releases.

Two BFF sightings and the discovery of a partially buried BFF skull have been recorded within the CD/WIIPA (WGFD 1995; WNDDDB 1995). In July 1972, two young ferrets were observed in the central portion of the CD/WIIPA about 5 mi south of Interstate Highway 80 (WNDDDB 1995). On August 14, 1975, a BFF was observed in saltbush habitat in the northern portion of the CD/WIIPA (WGFD 1995). The most recent evidence of BFF occurrence within the CD/WIIPA, a partially buried skull, was found in August 1981. This BFF skull was discovered in a white-tailed prairie dog town along the northeastern border of the CD/WIIPA and appeared to be quite weathered (WNDDDB 1995). Seven additional BFF observations have been recorded within the GCIAA, with the latest of these occurring in June 1977, about 5 mi north of Rawlins along State Highway 287.

The CD/WIIPA does not overlap any designated BFF management areas, and it is very unlikely that ferrets currently inhabit the CD/WIIPA. No evidence of BFF occupation has been documented in the CD/WIIPA for approximately 15 years.

E-5.1.1.2 Potential Effects

At present, it is anticipated that the proposed project is unlikely to adversely affect this species because BFFs are unlikely to occur in the area, and mitigation measures for BFFs will be applied.

The proposed project will likely have only negligible additional impacts, if any, to the cumulative effects on BFF habitat from ranching, mining, other oil and gas projects, and transportation and on prairie dogs from pest control and recreational shooting. However, if mitigation measures for BFFs are not applied on nonfederal lands, cumulative impacts may adversely affect BFFs and BFF habitat.

Table E-5.1 Summary of Potential Effects and Mitigations for Federal Threatened, Endangered, Candidate, and Special Concern Animal and Plant Species and Their Habitats On and Adjacent to the CD/WIIPA, Sweetwater and Carbon Counties, Wyoming, 1999.

Species	Level of Impact to Species ¹	Level of Impact to Habitat ¹	Mitigation Measures
ANIMALS			
Black-footed ferret	1; potential resident	1; potential habitat only	Search per USFWS (1989) guidelines to ensure no ferrets are in areas to be disturbed, and consult with USFWS if ferrets are found; disturbance to prairie dog colonies (i.e., potential ferret habitat) will be minimized.
Long-eared myotis	3; rare visitor	3; preferred habitat not present	Reserve, workover, and evaporation/production pits will be adequately protected (e.g., netted), as directed by the BLM, to prohibit bat access.
Long-legged myotis	3; rare visitor	3; negligible disturbance to foraging habitats	Reserve, workover, and evaporation/production pits will be adequately protected (e.g., netted), as directed by the BLM, to prohibit bat access.
Pale Townsend*s big-eared bat	3; uncommon visitor	3; negligible disturbance to foraging habitats	Reserve, workover, and evaporation/production pits will be adequately protected (e.g., netted), as directed by the BLM, to prohibit bat access.
Pygmy rabbit	3; not present	3; potential habitat only	None.
Small-footed myotis	3; uncommon visitor	3; negligible disturbance to foraging habitats	Reserve, workover, and evaporation/production pits will be adequately protected (e.g., netted), as directed by the BLM, to prohibit bat access.
Swift fox	2; potential resident	2; negligible disturbance to potential habitat	None.
Bald eagle	1; uncommon visitor	1; no known nests or roosts in CDPA; negligible disturbance to potential foraging habitat	If bald eagle roosts or active nests are found, no surface disturbance/occupancy will be allowed within 1.0 mi of active roosts or nests during periods of use.

Black tern	3; uncommon visitor	3; minimal amount of wetland habitat present	Wetland habitats will be avoided during construction.
Columbian sharp_tailed grouse	3; not present	3; preferred habitat not present (i.e., outside species known range)	None.
Ferruginous hawk	5; foraging birds may be displaced from disturbed areas	3; nest disturbance unlikely; potential for some displacement from foraging habitat, but overall disturbance to such habitat will be negligible	Nest searches will be conducted; no surface disturbance will be allowed within 1.0 mi of active nests during nesting season; artificial nest structures will be erected to replace nests built on ancillary structures.
Loggerhead shrike	5; nesting and foraging birds may be displaced from disturbed areas	3; negligible disturbance to nesting and/or foraging habitats	Site-specific searches for shrike nests will be conducted; nesting habitat will be avoided, where possible.
Mountain plover	4; nesting and foraging birds may be displaced from disturbed areas	2; unknown amount of potential nesting and foraging habitat will be disturbed	Disturbance to potential habitat will be minimized; site-specific searches for nesting plovers will be conducted; nesting birds will not be disturbed; construction activities may be delayed during nesting period.
Northern goshawk	3; rare visitor	3; preferred habitats not present	None.
Peregrine falcon	1; rare visitor; no known nests in the area	1; nesting habitat not present; negligible disturbance to foraging habitats	If nests are found in the area, no activity or surface disturbance will be allowed within 1.0 mi of active nests during nesting season.
Trumpeter swan	3; rare visitor	3; minimal amount of wetland habitat present	None.

Western burrowing owl	5; nesting and foraging birds may be displaced from disturbed areas	3; negligible disturbance of potential nesting and foraging habitat	Site-specific searches for nesting burrowing owls will be conducted; nesting birds will not be disturbed; construction activities may be delayed during nesting period; disturbance to prairie dog colonies will be minimized.
White-faced ibis	3; uncommon visitor	3; minimal amount of foraging habitat present	None.
Eastern short-horned lizard	5; some mortality possible during construction, but unlikely to adversely impact population health	3; negligible disturbance to habitats given the amount of adjacent potential habitat	None.
Bonytail chub	1; not present	1; no degradation of downstream waters	Proper and adequate construction techniques will be used when waterways must be crossed.
Colorado squawfish	1; not present	1; no degradation of downstream waters	Same as above.
Flannelmouth sucker	3; not present	3; no degradation of downstream waters	Proper and adequate construction techniques will be used when waterways must be crossed.
Humpback chub	1; not present	1; no degradation of downstream waters	Same as above.
Razorback sucker	1; not present	1; no degradation of downstream waters	Same as above.
Roundtail chub	3; not present	3; no degradation of downstream waters	Same as above.
PLANTS			
Big Piney milkvetch	3; unlikely to be present	3; outside known range	Site-specific surveys will be conducted for populations; conflict resolution with BLM and USFWS will be undertaken; potential habitat will be avoided, where possible.

Cedar Rim thistle	3; populations potentially present	3; minimal disturbance to potential habitats	Same as above.
Devil*s gate twinpod	3; unlikely to be present	3; outside known range	Same as above.
Gibben*s beardtongue	3; unlikely to be present	3; outside known range	Same as above.
Large-fruited bladderpod	3; populations potentially present	3; minimal disturbance to potential habitats	Same as above.
Mystery wormwood	3; populations potentially present	3; minimal disturbance to potential habitats	Same as above.
Opal phlox	3; populations potentially present	3; minimal disturbance to potential habitats	Same as above.
Ownbey*s thistle	3; unlikely to be present	3; outside known range	Same as above.
Tufted twinpod	3; unlikely to be present	3; outside known range	Same as above.
Utes ladies' tresses	3; unlikely to be present	3; outside known range	Same as above.
Wyoming tansymustard	3; populations potentially present	3; minimal disturbance to potential habitats	Same as above.

¹ Level of impact with project-wide mitigation--a relative measure of the intensity or "seriousness" of the project's impacts if only the project's general or project-wide mitigation measures were implemented.

- 1 = is not likely to adversely affect listed species.
 - 2 = is not likely to adversely affect candidate species.
 - 3 = is not likely to adversely affect species of special concern.
 - 4 = possible adverse effects to candidate species.
 - 5 = possible adverse effects to species of special concern.
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E-5.1.1.3 Mitigation Measures

Although it is very unlikely that BFFs are present in the vicinity of the proposed project, white-tailed prairie dog colonies are scattered throughout the CD/WIIPA and adjacent areas and could provide a potential prey base and habitat for BFFs. Aerial surveys of prairie dog colonies/complexes within the CD/WIIPA in 1995 and 1996 revealed that numerous prairie dog colonies are scattered throughout the CD/WIIPA (see Map 3.10 in the EIS); some of these colonies may encompass several hundred acres. If sufficient acreage and density of prairie dog colonies are present for potential BFF habitat (as defined in USFWS [1989] guidelines) in areas to be disturbed by the proposed project, a search per USFWS guidelines will be made on a site-specific basis to ensure that ferrets are not present in the area prior to construction activity. If BFFs are discovered in the CD/WIIPA, the USFWS, WGFD, and BLM will be consulted to determine the specific procedures necessary to protect the animals under established guidelines. To minimize disturbance to prairie dog colonies, project-required facilities will be located outside of prairie dog colonies, where possible.

E-5.1.2 Long-eared Myotis (Bat)

E-5.1.2.1 Current Status and Habitat Use

The long-eared myotis, a species of special concern, occurs throughout southwestern Canada, the western U.S., and Baja California (Hall 1981); it has also been observed throughout Wyoming (Clark and Stromberg 1987). This bat species is typically found in coniferous forests in mountainous areas (Barbour and Davis 1969) and is most common in ponderosa pine forests (Clark and Stromberg 1987). The feeding habits of the long-eared myotis are poorly understood, but their diet is probably composed primarily of insects since they feed well after sunset among trees and over open water (Barbour and Davis 1969; Clark and Stromberg 1987). A single observation of a long-eared myotis was recorded in September 1980, about 3 mi south-southwest of the CD/WIIPA (WGFD 1995). Due to the lack of forested habitats within the CD/WIIPA, however, it is likely that this was a migrating individual moving through the CD/WIIPA. It is anticipated that this bat species occurs only occasionally in the area for relatively short periods of time.

E-5.1.2.2 Potential Effects

Given the lack of observations and preferred habitat (i.e., coniferous forest) for the long_eared bat within the CD/WIIPA, it is unlikely that this species will be affected by the Proposed Action or alternatives. Cumulative impacts to this species or its preferred habitats will not increase as a result of the proposed project.

E-5.1.2.3 Mitigation Measures

Reserve, workover, and evaporation/production pits could be attractive to foraging bats, and potentially hazardous sites will be adequately protected (e.g., netted), as directed by the BLM, to prohibit bat access.

E-5.1.3 Long-legged Myotis

E-5.1.3.1 Current Status and Habitat Use

The long-legged myotis is a species of special concern, and is one of eight small mouse-eared bats known to occur in Wyoming. The long-legged myotis occurs throughout the western half of North America (Hall 1981) and has been reported as the most abundant mouse-eared bat species in the western U.S. (Clark and Stromberg 1987). It has been observed in a variety of habitats in Wyoming, including coniferous (e.g., Ponderosa pine) and deciduous forests, basin-prairie and mountain-foothills shrublands, and riparian areas (Clark and Stromberg 1987; WGFD 1992). The long-legged myotis roosts in tree hollows, snags, buildings, rock crevices, mines, and caves (Clark and Stromberg 1987). This species may hibernate in Wyoming during the winter and is extremely susceptible to disturbance during hibernation. Long-legged myotis feed exclusively on flying insects, especially moths.

Long-legged myotis have not been observed in the CD/WIIPA according to WNDDDB and WGFD records. This lack of observations may, at least in part, be due to the nocturnal activity of this species. Long-legged myotis are known to occur in a cave in the Shirley Mountains, approximately 60 mi east-northeast of the CD/WIIPA (personal communication, January 1995, with Bob Luce, Nongame Mammal Biologist, WGFD). It is possible that this bat species occasionally forages over habitats within the CD/WIIPA; however, it is unlikely that it is a common resident or visitor in the area.

E-5.1.3.2 Potential Effects

The long-legged myotis is an unlikely visitor to the CD/WIIPA given the lack of observations for the area. Individuals of this bat species may forage over the CD/WIIPA for short periods of time, but probably roost in locations remote from the area. Therefore, it is unlikely that this species will be affected by the Proposed Action or alternatives. Potential cumulative impacts to this species or its preferred habitats will not increase as a result of the proposed project.

E-5.1.3.3 Mitigation Measures

Reserve, workover, and evaporation/production pits could be attractive to foraging bats; and these potentially hazardous sites will be adequately protected (e.g., netted), as directed by the BLM, to prohibit bat access.

E-5.1.4 Pale Townsend's Big-eared Bat

E-5.1.4.1 Current Status and Habitat Use

The pale Townsend's big-eared bat, a species of special concern, occurs in southern British Columbia, throughout most of the intermountain and Rocky Mountain regions of the western U.S., and as far south as northern Mexico (Hall 1981). This species also occurs throughout Wyoming (Clark and Stromberg 1987) and most commonly forages in desert shrublands, pinyon-juniper woodlands, and dry coniferous forests (Barbour and Davis 1969). Like many bats, this species roosts primarily in caves and abandoned mine shafts. Pale Townsend's big-eared bats have been observed in a cave in the Shirley Mountains approximately 60 mi

east-northeast of the CD/WIIPA (personal communication, January 1995, with Bob Luce, Nongame Mammal Biologist, WGFD). The pale Townsend's big-eared bat is a moth specialist and hunts in flight (Clark and Stromberg 1987). Although no bats of this species have been observed on the CD/WIIPA, it is probably an occasional visitor to the area.

E-5.1.4.2 Potential Effects

Although the pale Townsend's big-eared bat may be the most likely TEC&SC bat species to inhabit and/or visit the CD/WIIPA due to its preference for habitats commonly found in the area, the probability of a big-eared bat being displaced or harmed by project construction and/or operation is relatively slight. Therefore, it is unlikely that the Proposed Action or alternatives will adversely affect this species. Also, potential cumulative impacts to this species or its preferred habitats will not increase as a result of the proposed project.

E-5.1.4.3 Mitigation Measures

Reserve, workover, and evaporation/production pits could be attractive to foraging bats, and potentially hazardous sites will be adequately protected (e.g., netted), as directed by the BLM, to prohibit bat access.

E-5.1.5 Pygmy Rabbit

E-5.1.5.1 Current Status and Habitat Use

The pygmy rabbit, a species of special concern, inhabits the Great Basin of northern Nevada, eastern Oregon, western Utah, and southern Idaho (Clark and Stromberg 1987). The population of pygmy rabbits in southwestern Wyoming is believed to be isolated from the western Utah population. The Utah population of pygmy rabbits is more than 100 mi to the west and separated from the Wyoming population by the Wasatch Mountains (Campbell et al. 1982). Pygmy rabbits in southwestern Wyoming are limited to dense tall stands of big sagebrush; this habitat is usually found along intermittent streams and occasional riparian areas in sagebrush-grasslands (Clark and Stromberg 1987; WGFD 1992). The vast majority (up to 99%) of the diet of this rabbit species consists of sagebrush, although it may include some grasses during summer.

Pygmy rabbits have been observed north and northeast of Rock Springs, Wyoming (WGFD 1995; WNDDDB 1995). The closest recorded observation to the CD/WIIPA was approximately 14 mi northwest of the area and included both pellets and burrows. It is unlikely that pygmy rabbits occur within the CD/WIIPA due to their limited distribution and specific habitat preference.

E-5.1.5.2 Potential Effects

It is unlikely that the Proposed Action or alternatives will adversely affect the pygmy rabbit population in southwestern Wyoming. Since there is limited information on the exact distribution of this species within the state, an effort will be made during the APD site analysis to look for sign of pygmy rabbits (e.g., observations, burrows, pellets) on those potential sites containing large dense stands of big sagebrush. The proposed project is unlikely to increase cumulative effects on pygmy rabbit populations or their preferred habitats.

E-5.1.6 Small-footed Myotis**E-5.1.6.1 Current Status and Habitat Use**

The small-footed myotis, a species of special concern, occurs throughout western North America (Hall 1981) and has been captured throughout Wyoming (Clark and Stromberg 1987). This species ranges throughout many of the habitats found in Wyoming, from sagebrush-grasslands to montane forests (Clark and Stromberg 1987; WGFD 1992). Small-footed myotis commonly roost in caves, abandoned mine shafts, rock crevices, and buildings (Barbour and Davis 1969); they are extremely tolerant of low temperatures during hibernation. The small-footed myotis feeds primarily on moths and beetles, hunts in flight, and uses sonar to locate prey. Although there are no recorded observations of this species within the CD/WIIPA, it is likely that small-footed myotis occasionally forage over the area.

E-5.1.6.2 Potential Effects

Small-footed myotis have not been observed within the CD/WIIPA, but may be potential visitors to the area. However, it is anticipated that the small-footed myotis will not be adversely affected by the Proposed Action or alternatives, and no increase in cumulative effects to this species is anticipated.

E-5.1.6.3 Mitigation Measures

Reserve, workover, and evaporation/production pits could be attractive to foraging bats, and potentially hazardous sites will be adequately protected (e.g., netted), as directed by the BLM, to prohibit bat access.

E-5.1.7 Swift Fox**E-5.1.7.1 Current Status and Habitat Use**

The swift fox, a federal candidate species (proposed threatened), is a resident of the Great Plains from the northern Rocky Mountain foothills in southern Canada to western Texas (Clark and Stromberg 1987). In Wyoming, this species primarily inhabits the eastern Great Plains grasslands, occasionally utilizing agricultural lands and irrigated native meadows. Prey for the swift fox includes small mammals, insects, and birds (WGFD 1992).

Several observations of swift fox have been reported from the Chain Lakes and Luman Ranch areas of the northern CD/WIIPA (personal communication, July 15, 1995, with Greg Hiatt, Wildlife Biologist, WGFD). Many of these swift fox observations were in habitats generally considered atypical for this species (e.g., greasewood). Another observation of a swift fox occurred in 1977 west of the CD/WIIPA and GCIAA (WNDDDB 1995).

E-5.1.7.2 Potential Effects

Disturbance of sagebrush-grasslands in the northern portion of the CD/WIIPA may reduce potential habitat for swift fox; however, no adverse effects to swift fox from the Proposed Action or alternatives are anticipated due to the relatively infrequent use of the area by this species and the relatively small amount of potential habitat disturbed. As a result, the proposed project will have only negligible additional effects, if any, to existing cumulative effects on swift fox habitat in the region.

E-5.2 BIRDS

E-5.2.1 Bald Eagle

E-5.2.1.1 Current Status and Habitat Use

The bald eagle is a federally threatened species that requires cliffs, large trees, or sheltered canyons associated with concentrated food sources (e.g., fisheries or waterfowl concentration areas) for nesting and/or roosting areas (Edwards 1969; Snow 1973; Call 1978; Steenhof 1978; Peterson 1986). Bald eagles forage over wide areas during the non-nesting season (i.e., fall and winter) and scavenge on animal carcasses such as pronghorn, deer, and elk. Bald eagles were only recently downlisted from a federally endangered status.

No known bald eagle nests or winter roosts are present on or within 2 mi of the CD/WIIPA; the lack of suitable nesting or winter roosting habitats within the CD/WIIPA precludes its use for such activities by bald eagles. There is only one recorded observation of a bald eagle occurring within the CD/WIIPA (WGFD 1995). Bald eagles, however, have been observed flying over and foraging throughout the GCIAA (WGFD 1995), and nests and concentrated winter roost sites occur along the Little Snake River in the southeastern portion of the GCIAA approximately 25 mi south/southeast of the CD/WIIPA. These birds tend to forage on road_killed deer in the area (personal communication, November 1993, with Bob Oakleaf, WGFD).

E-5.2.1.2 Potential Effects

Migrating bald eagles and those wintering in the Little Snake River drainage may occasionally use the CD/WIIPA for foraging; however, such use will likely be intermittent and for relatively short periods. Given this intermittent use and the lack of nesting and roosting habitat on the CD/WIIPA, it is anticipated that there will be no effect to this species from the Proposed Action or alternatives.

Cumulative impacts resulting from oil and gas development, surface mining, urban developments, and roads are unlikely to adversely affect bald eagles; some additional foraging habitat will be removed, but large areas remain available to eagles. Also, all developments (including the proposed project) will avoid winter roosts and active nests, further minimizing potential disturbance to the species.

E-5.2.1.3 Mitigation Measures

In the unlikely event that bald eagle roosting areas are found within the CD/WIIPA, a No Surface Occupancy restriction will be applied to a 1-mi buffer zone around winter roosts, and the area will be closed to surface-disturbing activities (e.g., construction, drilling) from November 1 through April 1. If an active bald eagle nest is found within the CD/WIIPA, no activity or surface disturbance will be allowed within a 1-mi radius of the nest between February 1 and July 31.

E-5.2.2 Black Tern

E-5.2.2.1 Current Status and Habitat Use

Black terns, a species of special concern, are spring and summer visitors to the U.S. which frequent marshes and aquatic areas as feeding and breeding sites (Scott 1987; Ehrlich et al. 1988; WGFD 1992). Nests are usually constructed in dense emergent vegetation, often on top of muskrat homes, floating debris, or little knolls in marshy areas (Bailey and Niedrach 1965; Ehrlich et al. 1988). Loss of wetland areas may be contributing to the decline of this species (Ehrlich et al. 1988).

The lack of extensive wetland areas within or adjacent to the CD/WIIPA may be the reason for the lack of observations of this species in the project area. There is only one recorded observation of black terns within or adjacent to the CD/WIIPA, although five additional observations of black terns have been recorded within the GCIAA (WGFD 1995).

E-5.2.2.2 Potential Effects

Because black terns are uncommon visitors to the CD/WIIPA and wetlands in the area will be avoided during construction, where possible, this species will not be adversely affected by the Proposed Action or alternatives.

E-5.2.3 Columbian Sharp-tailed Grouse

E-5.2.3.1 Current Status and Habitat Use

The Columbian sharp-tailed grouse, a species of special concern, is one of two sharp-tailed grouse subspecies found in Wyoming, the other being the plains sharp-tailed grouse. The Columbian sharp-tailed grouse is restricted to sagebrush-dominated mountain shrub communities in south-central Wyoming (Klott n.d.). In addition to sagebrush, these communities contain serviceberry, chokecherry, snowberry, bitterbrush, and rabbitbrush. Although Columbian sharp-tailed grouse were once found throughout western and southwestern Wyoming, herbicide treatments of large blocks of sagebrush/grass and mountain shrub habitats between 1950 and 1980 may have significantly reduced available habitat for these grouse.

There are no recorded observations of Columbian sharp-tailed grouse within or immediately adjacent to the CD/WIIPA. The majority of recorded observations for this species occur in the southeastern portion of the GCIAA (WGFD 1995), where the birds gather in leks during the spring breeding season.

E-5.2.3.2 Potential Effects

Columbian sharp-tailed grouse are not likely to occur within the CD/WIIPA or within 10mi of the area. Therefore, there will be no effects to Columbian sharp-tailed grouse resulting from the Proposed Action or alternatives. Also, there will be no increase in cumulative effects to Columbian sharp-tailed grouse as a result of the proposed project.

E-5.2.4 Ferruginous Hawk

E-5.2.4.1 Current Status and Habitat Use

The ferruginous hawk is a species of special concern that breeds in semi-arid plains and intermountain areas of the Great Basin and Great Plains (Evans 1983). This species often nests on low cliffs, buttes, and cutbanks (Call 1978), as well as in juniper or sagebrush along the edges of pinyon-juniper communities. Ferruginous hawks feed primarily on small to medium-sized mammals such as jackrabbits, cottontail rabbits, ground squirrels, and prairie dogs (Sherrod 1978).

Ferruginous hawks occur throughout the CD/WIIPA and GCIAA (WGFD 1995). A raptor nest survey of a majority of the CD/WIIPA and an adjacent 1.0-mi buffer was conducted during the 1995 and 1996 breeding seasons to provide current information on the activity status of raptor nests. Of a total of 684 raptor nests observed, 524 (76.6%) were ferruginous hawk nests. The majority of active raptor nests (69.7%, 23 nests) were also those of ferruginous hawks. Most of these ferruginous hawk nests are located in the southern half and eastern/northeastern portion of the CD/WIIPA. It is likely that at least several hundred more ferruginous hawk nests occur within the entire GCIAA. Ferruginous hawks regularly use the CD/WIIPA for foraging.

E-5.2.4.2 Potential Effects

The principle threat to ferruginous hawks from project activities is disturbance during nesting. Potential conflicts between active nest sites and project-related activities will be resolved by the BLM, in consultation with the USFWS and WGFD, to ensure that minimal impacts will occur to ferruginous hawks or their nesting success.

There will be a LOP loss of 8,300 acres, or 0.8%, of potential ferruginous hawk foraging habitat within the CD/WIIPA as a result of new disturbance from the Proposed Action. LOP loss of potential foraging habitat under the two development alternatives will likely be slightly less than that under the Proposed Action. In addition, ferruginous hawks avoid areas in close proximity to human activity; the presence of workers will temporarily reduce the availability of adjacent foraging habitat on a localized basis. Ferruginous hawks do not avoid areas immediately adjacent to man-made structures if humans are not present and even build nests on active oil or gas field facilities in the region (personal communication, January 1992, with Bob Tigner, Planning and Environmental Specialist, BLM). Impacts to ferruginous hawks on the CD/WIIPA resulting from foraging habitat losses and temporary displacement may adversely affect the species under either the Proposed Action or alternative actions; however, sufficient foraging habitat in areas removed from disturbance sites will be available to support ferruginous hawks.

Reduction in ferruginous hawk prey species is not anticipated to be a major concern since disturbance will be scattered throughout the CD/WIIPA. Therefore, the reduction in prey species will occur over a relatively large number of potential ferruginous hawk territories, limiting prey reduction to negligible levels in any one territory.

Cumulative habitat loss for ferruginous hawks (i.e., foraging and nesting habitat) due to all past, proposed, and potential future developments in the region (e.g., oil and gas development, surface mining) is unknown; however, sufficient habitats remain and will remain undisturbed and available to ferruginous hawks.

E-5.2.4.3 Mitigation Measures

Although no potential conflict between active ferruginous hawk nest sites and project activity is anticipated at present, any that may arise during the project will be resolved by the BLM, in consultation with the USFWS and WGFD, to ensure that adverse impacts to the species will be minimized (see Wildlife Protection Plan, EIS Appendix D). Surveys will be conducted to document the status of ferruginous hawk nests so that appropriate protective measures are stipulated during APD and ROW reviews. Activities near active ferruginous hawk nests will be prohibited within a 1.0-mi radius or other distance (determined by the BLM) to avoid disturbing birds from February 1 through July 31.

Ferruginous hawks occasionally construct nests on well site facilities in Wyoming (personal communication, January 1992, with Bob Tigner, BLM). If ferruginous hawks nest on production/operation facilities, artificial nesting structures will be provided as directed by the BLM in consultation with the USFWS. Artificial nesting structures have been successfully used by ferruginous hawks in the region (Call and Tigner 1991). The Operators will assist in the erection of artificial nesting structures.

E-5.2.5 Loggerhead Shrike**E-5.2.5.1 Current Status and Habitat Use**

In Wyoming, the loggerhead shrike, a species of special concern, inhabits sagebrush grasslands associated with stands of pinyon-juniper and larger shrubs (WGFD 1992). These habitats provide ample open areas in which to forage for insects and small vertebrates (Craig 1978; Bystrak 1983), as well as trees and shrubs in which to build their large bulky nests (Graber et al. 1973). Declines in loggerhead shrike populations have been noted over the past 40 years, and the declines appear to be most significant near the periphery of their range (the midwest and eastern U.S.) (Bystrak 1983). Reasons for the decline are unknown; habitat changes and pesticide use may play a role.

There are numerous recorded observations of loggerhead shrikes both within and adjacent to the CD/WIIPA (WGFD 1995), and the species is a fairly common summer resident of the area (WGFD 1992). Loggerhead shrikes likely nest within the CD/WIIPA.

E-5.2.5.2 Potential Effects

There will be a LOP loss of 8,300 acres of potential loggerhead shrike foraging and breeding habitat within the CD/WIIPA as a result of new disturbance from the Proposed Action; this represents approximately 0.8% of the CD/WIIPA. LOP loss of potential foraging and breeding habitat under the two development alternatives will likely be slightly less than that under the Proposed Action. Impacts to loggerhead shrikes on the CD/WIIPA resulting from foraging and breeding habitat loss, as well as human presence, may adversely affect the species; however, it is anticipated that loggerhead shrikes will not be permanently displaced, and shrikes will probably shift their foraging activity to surrounding areas not impacted by the project.

Because of the relatively minimal amount of loggerhead shrike nesting habitat that will be disturbed by the proposed project for the LOP and the scattered nature of this disturbance, it is anticipated that the proposed project will result in minimal cumulative impacts to this species.

E-5.2.5.3 Mitigation Measures

Surveys for active loggerhead shrike nests will be implemented prior to disturbance during on-site inspections of proposed ROWs and well locations conducted as components of ROW application and APD review processes. If active loggerhead shrike nests are found in the area to be disturbed, construction activities will be rescheduled such that the birds will not be disturbed during the nesting season.

E-5.2.6 Mountain Plover**E-5.2.6.1 Current Status and Habitat Use**

The mountain plover is a candidate species (proposed threatened) inhabiting the high dry short grass plains/prairies east of the Rocky Mountains (Dinsmore 1983), as well as the sagebrush grasslands throughout Wyoming (WGFD 1997). It is also known from northern Utah and northwestern Colorado (Knopf 1996). The focus of breeding activity appears to be northeastern Colorado (Graul and Webster 1976). Parrish et al. (1993) noted that mountain plover nests in northeastern Wyoming were found in areas of short (<4 inches) vegetation on slopes of less than 3%; any short grass, very short shrub, or cushion plant vegetation type could be considered nesting habitat. In Colorado, the mountain plover diet is composed of 99.7% arthropods, with beetles, grasshoppers, crickets, and ants the most important food items (Baldwin 1971). Breeding bird surveys

between 1966 and 1987 show an overall decline in the continental population of mountain plovers [U.S. Department of Agriculture, Forest Service [USFS] 1994a). Surveys completed in 1991 indicate that only 4,360 to 5,610 mountain plovers remain on the North American continent (USFS 1994b). Probably the most important reasons for the decline of the mountain plover are human impacts and habitat alteration on breeding grounds and the degradation in the quality of wintering habitats (e.g., southern Texas, California) (Knopf 1994, 1996). Loss of breeding habitat due to cultivation and prey base declines resulting from pesticide use are also threats to mountain plover survival (Wiens and Dyer 1975). Cattle often maintain the open blue grama/buffalo grass habitat favored by mountain plovers, so livestock grazing may benefit the species (Klipple and Costello 1960).

Mountain plovers have been observed throughout the CD/WIIPA and adjacent areas, and many of these observations occurred during the breeding season (WGFD 1995). Therefore, it is likely that mountain plovers not only forage within the CD/WIIPA, but also nest within the area.

E-5.2.6.2 Potential Effects

Loss of potential mountain plover breeding and foraging habitat due to proposed project activities may adversely affect the species. However, while the total extent of mountain plover habitat on the CD/WIIPA has not been defined, with the limited and scattered nature of habitat disturbance as well as proposed survey and avoidance measures, it is anticipated that this species will not be jeopardized or permanently displaced.

Cumulative impacts to the local mountain plover population will probably not jeopardize regional populations. Although disturbance due to oil and gas development, surface mining, urban developments, and roads has removed an unknown portion of potential mountain plover nesting habitat, it is unlikely that the extent of this habitat removal has jeopardized plover reproduction due to the dispersed nature of disturbance associated with oil and gas and other developments throughout the region. Therefore, displaced plovers will likely have adequate alternate habitats for foraging and nesting activities. Surface disturbance resulting from the proposed project will slightly increase cumulative impacts to mountain plovers, and such impacts are unknown for the foreseeable future.

E-5.2.6.3 Mitigation Measures

Mountain plover habitats will be avoided, where practical, and if construction within suitable mountain plover habitat (i.e., areas with low-growing vegetation) is planned between April 15 and June 30, surveys for nesting mountain plovers (i.e., a nest and/or defending pairs of adult mountain plovers) will be implemented prior to disturbance (see Section E_4.1, item 17). Surveys will be conducted during on-site inspections of proposed ROWs and well locations that are conducted as components of ROW application and APD review processes, and the USFWS will be consulted regarding effects determinations. If mountain plover nesting is found in the area, the USFWS will be consulted and construction activities will be rescheduled such that the birds will not be disturbed. Surveys will not be conducted for construction activities planned for the period July 1 through April 15.

E-5.2.7 Northern Goshawk

E-5.2.7.1 Current Status and Habitat Use

The northern goshawk, a species of special concern, inhabits coniferous forests, especially those with a significant Douglas fir and lodgepole pine component (WGFD 1992). Goshawks forage in a variety of habitats, including sagebrush-grassland areas adjacent to stands of coniferous forest. Prey includes small

mammals, waterfowl, songbirds, and insects (Terres 1980). Nests are often built high (i.e., >30 ft) in coniferous trees; some goshawks have been observed nesting in mature cottonwoods along riparian corridors (Call 1978).

Although northern goshawks have been observed in pinyon-juniper habitats within the GCIAA, no goshawks have been observed within the CD/WIIPA (WGFD 1995; WNDDDB 1995). While goshawks have been observed west of the CD/WIIPA (within 5 mi) (WGFD 1995), in general, habitats within the CD/WIIPA are not suitable for northern goshawk nesting or foraging.

E-5.2.7.2 Potential Effects

Since the CD/WIIPA lacks suitable northern goshawk habitat and no goshawks have been observed within the CD/WIIPA, the Proposed Action or alternatives will not adversely impact this species. Cumulative effects to northern goshawks will not increase as a result of the proposed project.

E-5.2.8 Peregrine Falcon

E-5.2.8.1 Current Status and Habitat Use

A federally endangered species, the peregrine falcon nests on tall cliffs, usually within 1.0mi of a stream or river, or extensive brush or woodlands; these habitats provide concentrated food sources and open areas in which to hunt (Snow 1972; Call 1978). Peregrine falcons nest among substantial rock outcroppings (usually southern exposure) in small caves or on overhanging ledges large enough to accommodate three to four full-grown nestlings (Wilderness Research Institute 1979). Peregrine falcons feed almost exclusively on birds, many of which are associated with riparian zones and large bodies of water (e.g., waterfowl).

No known peregrine falcon nests occur on or within 2 mi of the CD/WIIPA, nor have any peregrine falcons been reported in the area. There is only one recorded observation of a peregrine falcon in the entire GCIAA: a single bird was observed in the eastern portion of the GCIAA in 1981 (WGFD 1995). The absence of suitable cliffs within the CD/WIIPA precludes peregrine falcon nesting, although the area may be used on occasion for hunting by wintering or migrating peregrines.

E-5.2.8.2 Potential Effects

There is no evidence that peregrine falcons regularly utilize habitats in the vicinity of the CD/WIIPA. It is expected, therefore, that implementation of the Proposed Action or alternatives will not have any substantial direct or indirect impact (i.e., adverse effect) on the peregrine falcon.

E-5.2.8.3 Mitigation Measures

In the very unlikely event that an active peregrine falcon nest is found within or immediately adjacent to the CD/WIIPA, no activity or surface disturbance will be allowed within a 1.0_mi buffer zone around the nest between February 1 and July 31.

E-5.2.9 Trumpeter Swan

E-5.2.9.1 Current Status and Habitat Use

The trumpeter swan, a species of special concern, primarily breeds and winters in eastern Canada and Alaska; the majority of the population that occurs in Wyoming frequents the marshes, lakes, and rivers in the Greater Yellowstone Ecosystem during the spring and summer months and winters in Idaho (Terres 1980; WGFD 1992). Nests are usually built on a muskrat house or small island in a large pond or small lake (WGFD 1992). Adults feed mostly in shallow water on vegetation growing on the lake bottom (Terres 1980).

A single observation of a trumpeter swan occurred approximately 7.0 mi west of the CD/WIIPA in September 1985 (WGFD 1995). This was likely a vagrant individual that temporarily stopped in the area to feed or rest. If the limited wetlands within the CD/WIIPA are used by this species at all, it is probably during rare visits by transient individuals.

E-5.2.9.2 Potential Effects

Since the CD/WIIPA, for the most part, lacks appropriate trumpeter swan habitat, it is unlikely that the Proposed Action or alternatives will adversely affect the trumpeter swan, or increase cumulative effects to this species or its habitat.

E-5.2.10 Western Burrowing Owl

E-5.2.10.1 Current Status and Habitat Use

This small long-legged owl of short-grass prairie is a species of special concern. The burrowing owl occurs throughout western North America and winters on its breeding grounds, except in the northern Great Basin and Great Plains region (Terres 1980). This owl nests in colonies, often in abandoned burrows of prairie dogs or ground squirrels (Dorn and Dorn 1990; WGFD 1992). Burrowing owls feed primarily on insects, rodents, and small birds (e.g., sparrows and horned larks) (Terres 1980). This owl hunts primarily in early evening and throughout the night.

According to WGFD (1995) and WNDDDB (1995) observation records, burrowing owls have been observed throughout the CD/WIIPA and GCIAA. The most recent known observations in the region were in April 1992: a single bird was observed in Wyoming big sagebrush-grassland habitat in the central CD/WIIPA and two birds were observed in sagebrush-greasewood habitat about 1.0 mi northwest of the CD/WIIPA (WGFD 1995). It is likely that burrowing owls forage and nest within the CD/WIIPA, although burrowing owl observations have diminished over the last decade.

E-5.2.10.2 Potential Effects

It is possible that the proposed project could adversely affect western burrowing owls on the CD/WIIPA. Some potential burrowing owl foraging and nesting habitat will be disturbed due to the proposed project, although prairie dog colonies will be avoided, where possible, as part of the mitigation for black-footed ferrets and this avoidance will aid in protecting potential burrowing owl nesting habitat from extensive disturbance.

As with the mountain plover, some increase in disturbance to potential burrowing owl habitat will result in an increase in overall cumulative effects to this species. Given the dispersed nature of the disturbance and the availability of alternative habitat, cumulative impacts to the burrowing owl are unlikely to jeopardize regional

populations. It should be noted, however, that burrowing owl populations in the region have experienced a decline over the last decade, and the reasons for this decline are unclear. Further research and additional protection for prairie dog colonies may assist in the stabilization, if not the recovery, of regional owl populations.

E-5.2.10.3 Mitigation Measures

If construction is planned for spring or early summer, surveys for nesting western burrowing owls (i.e., a nest and/or a territorial pair) will be implemented prior to disturbance during on-site inspections of proposed ROWs and well locations conducted as components of ROW application and APD review processes. If burrowing owl nests are found on the area, construction activities will be moved or rescheduled such that the birds will not be disturbed. Prairie dog colonies (i.e., potential burrowing owl nesting habitat) will be avoided, where possible.

E-5.2.11 White-faced Ibis

E-5.2.11.1 Current Status and Habitat Use

The white-faced ibis is a species of special concern that frequents marshes, wet-moist meadows, lake shores, and irrigated meadows (WGFD 1992). Typical prey includes insects, leeches, earthworms, frogs, and fish (Terres 1980). The species breeds in colonies ranging from a few to several thousand birds in extensive freshwater marshes sporadically distributed from the Pacific Coast to the Great Plains (Erwin 1983). Breeding colonies have been observed at Hutton Lake National Wildlife Refuge in southeastern Wyoming and several locations in southwestern Wyoming (WGFD 1992).

Although white-faced ibises have been occasionally observed within and adjacent to the CD/WIIPA, no breeding colonies occur within the area. The CD/WIIPA contains very little potential nesting habitat for the species. Ibises observed on the CD/WIIPA are likely transient individuals using the area for brief periods for resting and foraging during migration.

E-5.2.11.2 Potential Effects

Because of the lack of potential nesting habitat and low numbers of ibises that use the area, no effects to white-faced ibises are anticipated to result from either the Proposed Action or alternatives. Also, no increase in cumulative effects to this species or its habitat are anticipated due to the proposed project.

E-5.3 REPTILES (EASTERN SHORT-HORNED LIZARD)

E-5.3.1 Current Status and Habitat Use

A species of special concern, the eastern short-horned lizard is found throughout most of Wyoming below about 6,500 ft; it is especially common in sagebrush-grassland communities in the central and southwestern counties of the state. Short-horned lizards favor areas with firm soils that are relatively flat and arid (Baxter and Stone 1985). These ground dwellers forage diurnally, primarily feeding on ants and beetles, and bear their young live in relatively large litters (Baxter and Stone 1985).

Eastern short-horned lizards have been observed within both the CD/WIIPA and GCIAA (WGFD 1995). The species is probably a relatively common resident of sagebrush-grassland and short-grass habitats within the CD/WIIPA.

E-5.3.2 Potential Effects

The proposed project may adversely affect eastern short-horned lizards in the CD/WIIPA; however, the project is unlikely to jeopardize regional populations of the species. This reptile species has been observed within the CD/WIIPA, and it is likely that much of the project area represents suitable habitat for the eastern short-horned lizard. Although some disturbance of areas containing short-horned lizards will likely occur under either the Proposed Action or alternatives, overall loss of habitat for this species within the CD/WIIPA probably will be negligible (a maximum of 8,300 acres LOP, 0.8% of the CD/WIIPA). A slight increase in direct mortality of short-horned lizards may initially occur due to project construction and may remain slightly elevated for the LOP due to increased traffic.

It is anticipated that the proposed project will not significantly increase existing and foreseeable future cumulative impacts (e.g., oil and gas development, mining, recreation) to short_horned lizards and their habitat in the region (i.e., unlikely to jeopardize).

E-5.4 FISH

E-5.4.1 Bonytail Chub, Colorado Squawfish, Humpback Chub, and Razorback Sucker

E-5.4.1.1 Current Status and Habitat Use

The bonytail chub, Colorado squawfish, humpback chub, and razorback sucker are federally endangered species, and all four species are residents of the Green and Colorado River systems (USFWS 1987; Tyus and Karp 1989; Matthews 1990). Although once abundant throughout both of these river systems, all four species are now limited to reaches of river that are either relatively undisturbed or controlled to provide appropriate flows. Reservoir impoundments and water diversions are the main threats to these species.

None of these species occur within or adjacent to the CD/WIIPA; it is likely that the closest occurrence of these species is in the lower Little Snake River drainage of Colorado (Tyus and Karp 1989).

E-5.4.1.2 Potential Effects

No effect to these downstream fish species from the Proposed Action or alternatives is anticipated because of the mitigation measures described in Chapter E-4.0 of this BA (see item 13).

E-5.4.2 Flannemouth Sucker and Roundtail Chub

E-5.4.2.1 Current Status and Habitat Use

The flannemouth sucker and roundtail chub are species of special concern and residents of the Green and Colorado River systems (Baxter and Simon 1970; Lee et al. 1980). As with the endangered fish species described in Section 5.4.1, declines in populations of these species are attributable to stream and river degradation from impoundment and diversion projects within the Green and Colorado River systems.

Both species occur in the Little Snake River south and east of the CD/WIIPA (Baxter and Simon 1970; Johnson and Oberholtzer 1987; WNDDb 1995). Flannemouth sucker and roundtail chub have also been observed in Muddy Creek in the southeastern portion of the GCIAA (Johnson and Oberholtzer 1987; WNDDb 1995).

E-5.4.2.2 Potential Effects

No effect to these downstream fish species from the Proposed Action or alternatives is anticipated because of the mitigation measures described in Chapter E-4.0 of this BA (see item 13).

E-5.5 PLANTS

All 11 species of the TEC&SC plants presented below are species of special concern, and Ute ladies' tresses is also listed as threatened by the USFWS. Five species could occur within the CD/WIIPA due to habitat preference or observation: Cedar Rim thistle, large fruited bladderpod, mystery wormwood, opal phlox, and Wyoming tansymustard. The other six species (Devil's gate twinpod, Gibben's beardtongue, Big Piney milkvetch, tufted twinpod, Utes ladies' tresses, and Ownbey's thistle) are unlikely to occur within the CD/WIIPA.

Potential impacts (including cumulative impacts) to these plant species are unlikely to jeopardize regional populations, especially given adherence to mitigation measures. Mitigation measures for TEC&SC plant species will include, but are not be limited to:

- surveying areas to be disturbed prior to disturbance;
- avoiding known TEC&SC plant populations; and
- other mitigation approved by the USFWS and the BLM if avoidance is not feasible.

A brief description of the habitats of occurrence and known locations of the 11 species of special concern is presented below.

E-5.5.1 Big Piney Milkvetch

The Big Piney milkvetch, also called Bastard draba milkvetch, is a mat-forming perennial herb with flowering stems less than 2.5 cm high. This plant is characterized by pink-purple flowers less than 7 mm long and spoon-shaped to linear leaves (5-25 mm) that are covered with silvery hairs. The mature fruits, which are keeled and grooved, are required to distinguish this plant from similar species (*A. spatulatus*). While endemic to the Green River Basin, Wyoming, it has not been documented in the CD/WIIPA. It has been found flowering in May-July in sagebrush and cushion plant communities in Sublette County, Wyoming. It prefers sandstone, stony clay, badlands, and barren clay slopes and ridges at elevations of 6,900-7,200 ft above sea level (Fertig et al. 1994).

E-5.5.2 Cedar Rim Thistle

This spiny perennial forb with lavender flowers usually grows no taller than 12 inches (Fertig et al. 1994). It is endemic to the Wind River and Green River basins of central Wyoming (i.e., Fremont and Sublette Counties) and is generally found on barren chalky hills, gravelly slopes, and fine-textured sandy-shale draws at elevations between 6,700 and 7,200 ft (Dorn 1992; Fertig et al. 1994).

Cedar Rim thistle has not been observed within the CD/WIIPA. The closest observation was about 10 mi west-northwest of the CD/WIIPA (WNDDDB 1995); the thistles were in a barren steep draw of sandy clay within a dense hillside community of antelope bitterbrush (*Purshia tridentata*), rabbitbrush (*Chrysothamnus*), and mountain mahogany (*Cercocarpus montanus*).

E-5.5.3 Devil*s Gate Twinpod

This prostrate perennial herb has whitish or pale yellow flowers and two-lobed inflated fruits that extend out from the main body of the plant on short stems (Fertig et al. 1994). This plant has been seen within cushion plant communities on calcareous ridges, eroded sandstone or limestone, or in soil-filled crevices in granite outcrops (Dorn 1992; Fertig et al. 1994). Devil*s gate twinpod is endemic to the Sweetwater and Platte River basins in central Wyoming (Carbon, Fremont, and Natrona Counties). Devil*s gate twinpod has not been observed within the CD/WIIPA; however, it has been observed along the northern and northeastern border of the GCIAA on wind-swept ridges (WNDDDB 1995).

E-5.5.4 Gibben*s Beardtongue

This species favors exposed outcrops of shale and sandstone with slopes of 20 to 30E on poorly developed soils. Gibben's beardtongue is subject to minimal competition from other plants (Dorn 1990; BLM 1992). Dorn (1990) found that populations of Gibben's beardtongue were stable and recommended that the status of this plant be downgraded due to the lack of potential threats. Gibben*s beardtongue has not been observed within the CD/WIIPA; the closest populations of the plant occur within the GCIAA along the Wyoming-Colorado border (WNDDDB 1995).

E-5.5.5 Large-fruited Bladderpod

The large-fruited bladderpod is a perennial forb with recumbent stems up to 12 inches long (Fertig et al. 1994). The flowers are tiny and yellow, and the fruit is inflated and slightly hairy. This plant is found at elevations between 7,200 and 7,700 ft on gypsum-clay hills (barren), benches, and clay flats along the western edge of the Great Divide Basin (Dorn 1992; Fertig et al. 1994).

Although the large-fruited bladderpod has been observed within the GCIAA (WNDDDB 1995), it has not been observed within the CD/WIIPA. The closest observation was about 8 mi northwest of the CD/WIIPA; the plants were located on a barren clay knob (WNDDDB 1995).

E-5.5.6 Mystery Wormwood

Mystery wormwood is a biennial forb with 12-inch stems that branch from the base (Fertig et al. 1994). The inflorescence is dense and spike-like, and the flower heads are small and numerous. Mystery wormwood is endemic to Sweetwater County and has been observed on clay flats and playas at about 6,500 ft in elevation (Dorn 1992; Fertig et al. 1994). Mystery wormwood has not been observed in the CD/WIIPA; the closest known population of these plants is on a clay flat about 6 mi west of the CD/WIIPA (WNDDDB 1995).

E-5.5.7 Opal Phlox

Opal phlox is a low-growing perennial herb 7 cm or less in height; stems are loosely matted. Flowers are white or pink and appear from May through June. It prefers clay slopes and ridges at elevations from 6,700 to 6,900 ft. Associated vegetation includes *Artemisia pedatifida*, *Eriogonum* spp., *Arenaria hookeri*, *Atriplex gardneri*, and *Sphaeromeria argentea*. Endemic to southwest Wyoming (Lincoln, Sweetwater, and Uinta Counties), it has not been found in the CD/WIIPA, but habitat is present support this plant (Fertig 1996; Fertig et al. 1994).

E-5.5.8 Ownbey*s Thistle

This spiny perennial forb grows to about 28 inches in height and possesses terminal flower heads that are white to rose-pink (Dorn 1992; Fertig et al. 1994). Ownbey*s thistle is endemic to northeastern Utah, northwestern Colorado, and southwestern Wyoming (Sweetwater County). In Wyoming, it has been found on sparsely vegetated shaley slopes in juniper (*Juniperus*), sagebrush (*Artemisia*), and riparian communities along the Wyoming-Colorado border (Fertig et al. 1994). Ownbey*s thistle has not been observed in either the CD/WIIPA or the GCIAA (WNDDDB 1995).

E-5.5.9 Tufted Twinpod

Tufted twinpod is a perennial herb growing to 8 cm high on sparsely vegetated shale slopes and ridges from 6,500 to 7,000 ft in elevation. It has not been document in the CD/WIIPA but is endemic to southwestern Wyoming (Lincoln, Sublette, and Uinta Counties). A member of the mustard family, it is characterized by bright yellow flowers (4-7 mm long), basal silvery pubescent leaves, and inflated deeply lobed fruits. Mature fruits are required for positive identification (Fertig et al. 1994).

E-5.5.10 Utes Ladies* Tresses

Ute ladies* tresses is a perennial terrestrial orchid 20 to 50 cm in height with narrow leaves and small white or ivory flowers clustered into a spike arrangement. This orchid is endemic to moist soils near wetland meadows, springs, lakes, and perennial streams from 4,200 to 7,000 ft above sea level. Utes ladies* tresses colonize

early successional riparian habitats such as point bars, sandbars, and low-lying gravelly, sandy, or cobbly edges and persist in those areas that are provided with perennial moisture. They are intolerant of shade and usually occur as small scattered groups (USFWS 1997).

The Ute ladies* tresses orchid is not known to occur in the CD/WIIPA; however, populations occur in Colorado along the Front Range, in Utah on the south side of the Uinta Mountains, and in the Niobrara, Cheyenne, and North Platte river drainages in Wyoming. It is possible that this orchid could be discovered in the project cumulative impact areas (USFWS 1997); however, with the implementation of proposed mitigation measures, the proposed project and associated cumulative impacts are unlikely to affect the species.

E-5.5.11 Wyoming Tansymustard

The Wyoming tansymustard is a tiny biennial or short-lived forb with multiple stems; stem height rarely exceeds 6 inches (Fertig et al. 1994). The flowers of this plant are tiny (1.5mm long) and yellow, and the fruits are linear and hairy. The Wyoming tansymustard has been observed at elevations between 8,300 and 10,000 ft on sparsely vegetated sandy slopes at the base of volcanic breccia or sandstone cliffs (Fertig et al. 1994). The species is endemic to the Absaroka Mountains and the Rock Springs Uplift in Wyoming (including Fremont and Sweetwater Counties).

The Wyoming tansymustard has not been observed within the CD/WIIPA. The closest observation of this species was about 3 mi west of the CD/WIIPA along the base of a sandstone cliff with miner's candle (*Cryptantha*), phacelia (*Phacelia*), sandwort (*Arenaria*), and tufted evening primrose (*Oenothera caespitosa*) (WNDDDB 1995).

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APPENDIX F:
ENVIRONMENTAL STANDARDS, PROCEDURES, AND REQUIREMENTS FOR
IMPLEMENTATION OF THE CONTINENTAL DIVIDE/WAMSUTTER II
NATURAL GAS PROJECT

ABBREVIATIONS AND ACRONYMS

APD	Application for Permit to Drill
ATVs	All_terrain vehicles
bbls	Barrels of condensate
bcpd	Barrels of condensate per day
BLM	Bureau of Land Management
CD/WII	Continental Divide/Wamsutter II
CD/WIIPA	Continental Divide/Wamsutter II Project Area
C.F.R.	<i>Code of Federal Regulations</i>
CO ₂	Carbon dioxide
COE	U.S. Army Corps of Engineers
DEIS	Draft Environmental Impact Statement
DOT	U.S. Department of Transportation
EA	Environmental Assessment
EIS	Environmental Impact Statement
H ₂ S	Hydrogen sulfide
hp	Horsepower
IDT	Interdisciplinary Team
LOP	Life-of-Project
mmcf	million cubic feet
mmcfd	million cubic feet per day
mph	Miles per hour
MSDS	Material Safety Data Sheet
N ₂	Nitrogen
NAAQS	National Ambient Air Quality Standards
NCPA	National Cultural Programmatic Agreement
NEPA	<i>National Environmental Policy Act</i>
NPDES	National Pollutant Discharge Elimination System
NOS	Notice of Staking
OSHA	Occupational Safety and Health Administration
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
RMP	Resource Management Plan
ROD	Record of Decision
ROW	Right-of-way
SARA	<i>Superfund Amendments and Reauthorization Act</i>
SHPO	State Historic Preservation Office
SN	Sundry Notice
SPCC	Spill Prevention Control and Countermeasure
SWPP	Stormwater Pollution Prevention
T&E	Threatened and endangered
TP	Transportation Plan
TPQ	Threshold Planning Quantity
TPTSD	Transportation Planning Technical Support Document
USDI	U.S. Department of Interior
USFWS	U.S. Fish and Wildlife Service
WAAQS	Wyoming Ambient Air Quality Standards
WDEQ-AQD	Wyoming Department of Environmental Quality-Air Quality Division
WDEQ-LQD	Wyoming Department of Environmental Quality-Land Quality Division
WDEQ-WQD	Wyoming Department of Environmental Quality-Water Quality Division
WDOT	Wyoming Department of Transportation
WGFD	Wyoming Game and Fish Department
WOGCC	Wyoming Oil and Gas Conservation Commission
WSEO	Wyoming State Engineer's Office
WSP	Wyoming State Protocol

**F-1.0 ENVIRONMENTAL STANDARDS, PROCEDURES, AND
REQUIREMENTS FOR IMPLEMENTATION OF THE
CONTINENTAL DIVIDE/WAMSUTTER II
NATURAL GAS PROJECT**

The environmental standards, procedures, mitigations, and monitoring measures presented herein were proposed by Operators as components of the proposed project and/or were developed in response to identified impacts and measures proposed during the scoping process and from findings of the environmental impact statement (EIS) analysis. These measures describe how project activities will be implemented to assure compliance with resource management goals and objectives for the Continental Divide/Wamsutter II (CD/WII) project area (CD/WIIPA), applicable lease stipulations, and additional environmental protection goals identified from the EIS analyses. All measures identified in this appendix will become components of the modified Proposed Action, unless otherwise indicated.

F-2.0 PROJECT-WIDE DEVELOPMENT SPECIFICATIONS

The Bureau of Land Management (BLM) will implement the planning and environmental protection measures identified in the Reclamation Plan (see Record of Decision [ROD] AppendixA), Transportation Plan (TP) (see ROD AppendixB) and associated Transportation Planning Technical Support Document (TPTSD), and Wildlife Protection Plan (see ROD AppendixD) for this project. All lease terms, resource management plan (RMP) mandates, and federal, state, and local laws, rules, and regulations will be adhered to.

Design, construction, operation, and reclamation practices may be modified by the Operators and/or the BLM as more site_specific economic, engineering, and environmental information becomes available. Site_specific development plans, including *National Environmental Policy Act* (NEPA)_mandated environmental analyses on all Applications for Permits to Drill (APDs), right-of-way (ROW) applications, and Sundry Notices (SNs), will be prepared for each proposed well, road, pipeline, or ancillary facility constructed on federal land. Pursuant to Onshore Oil and Gas Order Nos. 1 and2, each proposed well on federal land will require BLM approval of an APD prior to any surface disturbance. Each APD will include site_specific information regarding all facets of well development, including mitigation measures required to minimize adverse environmental impacts. Roads, pipelines, and ancillary facilities on BLM lands constructed in association with this project will require BLM ROW authorizations and/or SNs which could include additional mitigation to further minimize environmental impacts. Wells proposed on private and state lands will require approval by the Wyoming Oil and Gas Conservation Commission (WOGCC), and roads, pipelines, and/or ancillary facilities on these lands will require private landowner or state approval prior to construction.

Construction, operation, and reclamation of well locations, access roads, pipelines, and all other surface_disturbing activities will comply with BLM mitigation guidelines and best management practices as presented in the applicant-committed measures (see below) and in the Reclamation Plan for this project (ROD AppendixA). Road construction will adhere to specifications in the BLM Roads Standards Manual, Section 9113 and the TP for this project (ROD AppendixB).

F-2.1 PROJECT_WIDE DEVELOPMENT SPECIFICATIONS

The following project_wide development specifications apply to the Proposed Action. All lease terms, RMP mandates, and federal, state, and local laws, rules, and regulations will be adhered to.

Design, construction, operation, and reclamation practices may be modified by the Operators and/or the BLM as more site_specific economic, engineering, and environmental information becomes available. Site_specific development plans, including NEPA_mandated environmental analyses on all APDs, ROW applications, and Sundry Notices, will be prepared for each proposed well, road, pipeline, or ancillary facility constructed on federal land. Pursuant to Onshore Oil and Gas Order Nos. 1 and2, each proposed well on federal land will require BLM approval of an APD prior to any surface disturbance. Each APD will include site_specific information regarding all facets of well development, including mitigation measures required to minimize adverse environmental impacts. Roads, pipelines, and ancillary facilities on BLM lands constructed in association with this project will require BLM ROW authorizations and/or Sundry Notices which may include additional mitigation to further minimize environmental impacts. Wells proposed on private and state lands will require approval by the WOGCC, and roads, pipelines, and/or ancillary facilities on these lands will require private landowner or state approval prior to construction.

Whereas project components may undergo revision during agency reviews of individual APDs and ROW applications, these revisions will not substantially alter acreage requirements or general reclamation practices and will therefore be consistent with the environmental analysis presented in the EIS. Regardless, more

detailed site-specific analysis will be required prior to development activities, and any changes will be addressed in subsequent analyses.

Construction, operation, and reclamation of well locations, access roads, pipelines, and all other surface-disturbing activities will comply with BLM mitigation guidelines and best management practices. Road construction will adhere to specifications in the BLM Roads Standards Manual, Section 9113 (BLM 1985, 1991a) and the TP for this project (AppendixB).

Operators will follow the procedures outlined below to gain BLM approval for proposed activities on federal lands within the CD/WIIPA. Permitting procedures on State of Wyoming and private lands will adhere to WOGCC rules and regulations (WOGCC 1998) and be subject to individual landowner preferences for development, operation, and reclamation practices. Since the BLM has limited authority to regulate developments on private and state lands, procedural modifications, (including alternate construction, operation, mitigation, and reclamation) could occur.

F-2.2 PRECONSTRUCTION PLANNING AND SITE LAYOUT

Prior to the start of construction activities, Operators will submit a Notice of Staking (NOS)/APD/SN/ROW Application to the BLM with a map showing the specific location of the proposed activity (e.g., specific well location, road or pipeline route, or other facility site), as well as site-specific construction plans. Proposed development sites will be staked by the applicant and inspected by the BLM to ensure consistency with the application. An environmental assessment (EA) will be prepared to ensure all site-specific resources are evaluated and proposed operations comply with RMP and ROD decisions. Applications will be revised as necessary per negotiations with the BLM. The BLM will either deny or approve specific proposals and attach terms and conditions of approval to the permit. Upon receipt of BLM approval, the applicant may commence with proposed activities.

F-2.3 ROAD CONSTRUCTION AND USE

F-2.3.1 Road Construction and Maintenance

Access to the CD/WIIPA will be from I_80, Wyoming Highway 789, Sweetwater County Roads 4_23 and 4_19, and other existing and newly constructed or upgraded roads in the CD/WIIPA. To access new well locations and facility sites, new roads will be constructed and existing roads may be improved. Site-specific analyses would be conducted on new and improved roads, and proper authorizations (i.e., ROW permits, APDs) would be obtained prior to construction. Road authorization, use, and maintenance responsibilities would be coordinated with area users, and roads on federal lands will be constructed following guidelines in the BLM road standards manual, Section 9113 (BLM 1985, 1991a). Roads will be built and maintained to provide year-round access.

The exact location of proposed roads within the CD/WIIPA is not known; however, specific access road construction will be in accordance with the BLM-approved TP (AppendixB) and the associated TPTSD for this project (BLM 1999a). New roads will be located to minimize disturbance, utilize existing disturbed areas (e.g., existing roads and pipeline corridors), avoid sensitive resources (e.g., raptor nests, cultural resource sites), and maximize transportation efficiency. Since much of the CD/WIIPA presently has only limited access by vehicles, it is estimated that 0.5-1.5 mi of new or upgraded road will be needed to access each well location or facilities site. Approximately 1.5 mi of new or upgraded road will be required for each well location or facilities site during exploration and initial development; however, in developed areas and as field development proceeds in other areas, it is estimated that an average of 0.5 mi or less of road will be required for each location.

Figure F-2.1 illustrates a typical road cross section with a parallel pipeline ROW. Surface disturbance will be contained within approved ROWs and will average 52 ft for collector roads (60-ft ROW), 48ft for local roads (55-ft ROW), and 42ft for resource roads (50-ft ROW). Disturbance width may increase in areas of rugged topography due to the necessity for cuts and fills.

Road classification is the process of grouping roads having like characteristics into distinct categories and, for the CD/WIIPA, defines the administrative and jurisdictional characteristics of each road classification. This classification will help identify road types and jurisdictional responsibilities by defining public roads, administered by the state and county agencies, and management roads, administered and controlled by the private and public land managers.

The following functional classifications are based on BLM Manual Section 9113 (BLM 1985) and Federal Highway Administration classifications (U.S. Department of Transportation [DOT] Federal Highway Administration 1992).

Arterial (Public Roads). Arterial roads serve large areas and are considered to be public roads. Arterial roads within the CD/WIIPA include Wyoming state highways and Sweetwater and Carbon County roads. These roads are heavily traveled routes connecting developed areas of the CD/WIIPA to I_80, railroad crossings, industrial developments, services, and residential areas. These roads can be considered all_weather roads, and use of these roads is controlled by the Wyoming Department of Transportation (WDOT) or the respective county commissioners.

Arterial roads will be double-lane roads with shoulders and will be designed and constructed according to applicable state or county standards.

Collector (Management Roads). Collector roads serve smaller areas than arterial roads and may be divided into major and minor categories. Collectors channel moderate to heavy traffic to and from the arterial system. Major and minor collector roads within the CD/WIIPA are defined as follows.

- **Major Collector.** Developed roads with recorded easements that provides public and industry access to the CD/WIIPA will be are classified as a major collector road. Commonly, major collector roads will be BLM roads that are not a permanent part of the BLM road system, but are managed by BLM. A county road will be classified as a major collector if it supports only occasional use.
- **Minor Collector.** Developed roads with authorized ROWs issued by private landowners, BLM, or other land managers are classified as minor collector roads. These roads may include public_use rights, but use of these roads is at the discretion of the landowners and agencies. Portions of minor collector roads may have specific enforceable access restrictions.

Collector road maintenance objectives include the maintenance and improvement of drainage, road surfacing, and road grading to a smooth compact surface.

Collector roads will be double-lane roads and will be 24 ft wide after surfacing, with 4:1 ditches a minimum of 1 ft deep. These roads will have a gravel surface designed to support highway loads and provide a smooth compact road surface (without washboarding). Dust control may be required to retain the fines in the gravel. Collector roads will be designed for a minimum travel speed of 35miles per hour (mph).

Local (Management Roads). Local roads normally serve smaller areas than collector roads, channeling light to moderate traffic to a collector or arterial system. Local roads may support very heavy off_highway loads.

Authorization for use of local roads is at the discretion of the landowner or agencies. Local roads within the CD/WIIPA will serve specific groups of wells, services, or support facilities, and these roads may become a permanent part of a larger road system. Maintenance objectives will include maintaining drainage, surfacing selected segments, or road surface grading.

Local roads will be either double lane (20_24 ft wide after surfacing) or single lane (14_16ft wide after surfacing) with turnouts and will have 4:1 ditches a minimum of 1 ft deep. Gravel surfaces will be designed to support heavy loads in excess of standard highway loads. Depending on the length of the road, smoothness of the surface may be less important than the ability of the surface to support heavy loads. Local roads will be designed for speeds of 20_30mph.

Resource (Management Roads). A resource road will serve a specific destination and connect to local, collector, or arterial road systems. They may dead_end at single well/service facilities or serve small numbers of wells or facilities. Depending on the level of activity, a resource road could serve light traffic and very heavy loads. Authorization and use of resource roads are at the discretion of the landowner or agencies. The maintenance objective for resource roads will be to minimize resource damage. A resource road will be abandoned and reclaimed when the road is no longer needed. Occasionally a resource road could be stabilized and allowed to revert to a two_track trail.

Resource roads will be single lane roads with turnouts (14-16 ft wide after surfacing) with 4:1 ditches a minimum of 1 ft deep. Gravel, if needed, will be of sufficient quality to support heavy loads for short durations. The surface of a resource road is not required to be smooth. Resource roads will be designed for speeds of 15-30 mph.

Arterial collector, local, and resource roads in producing fields will be appropriately surfaced (e.g., aggregate, crushed rock) immediately following construction. Resource roads to exploratory well sites will be surfaced only after the well has been determined to be productive, unless otherwise directed by the BLM. Surfacing materials will be obtained from existing or newly constructed aggregate source pits located on federal, state, and/or private lands in or near the CD/WIIPA.

Roads across federal lands will be designed by a licensed professional engineer, as deemed appropriate by the BLM, and all roads will be constructed with adequate drainage and erosion control structures (e.g., relief culverts, drainage culverts, wing ditches, water bars). To further decrease potential impacts, the number and miles of roads will be limited by discouraging development of looped roads and by accessing well locations from short spurs off existing, local, and/or collector roads, where feasible. Roads will be closed and reclaimed by the operators when they are no longer required for the project unless otherwise directed by the BLM.

Approximately four people (i.e., road construction crews which are usually locally contracted by the operator) will be required for construction of each road, and each mile of road will require 3days to complete (TableF-2.1). During operations, roads will be maintained for year_round access. Road maintenance will typically include the application of surface materials, grading during the summer and fall months, and snow removal during the winter. Further details on road construction and maintenance specifications are provided in the TP (AppendixB) and the TPTSD (BLM 1999a) for this project.

Available topsoil will be removed during road construction and placed on the backslope area of borrow ditches within road ROWs. Topsoil will be respread on approximately 11.5 ft of both sides of all roads and reseeded as soon as possible and within 2 years after production testing indicates the well will be a producer and pipelines are installed. The entire road ROW to unproductive wells and the entire well location will be reclaimed as soon as practical, and reclamation activities will normally be completed within 2 years using stockpiled topsoil and BLM_approved seeding techniques. All newly developed roads will be reclaimed upon project

abandonment unless otherwise directed by the BLM in consultation with private landowners, county agencies, and other entities as necessary. Further road reclamation guidelines are provided in Appendix A.

F-2.3.2 Road Use

Estimated traffic requirements for the proposed project are presented in Table F-2.2.

Table F-2.1 Estimated Employment Requirements, Continental Divide/Wamsutter II Natural Gas Project, Sweetwater and Carbon Counties, Wyoming, 1999.

Employment Category	No. Personnel for Each Well/ Operation Crew	Maximum No. Simultaneously Active Crews	Total No. Individuals	Total No. Person-years ¹ Required for Maximum Development
Well Construction/Development				
Access road and well pad construction (5 days/location)	4	3	12	231
Rig transport and rig_up operations (4days/well)	15	15	225	692
Drilling (20 days/well)	21	15	315	4,846
Completion/testing (15 days/well) ²	11	15	165	1,904
Pipeline and ancillary facility installation (12 days/location)	6	6	36	831
Operations/Maintenance (30 years/well)				
Production (LOP) ³	11	48	58	2,050
Workovers/abandonment (10 days every 10years/well) ⁴	7	7	49	2,423
Reclamation (3 days/location)	3	1	3	104
Total	--	--	863	13,081

¹ Assumes all wells are drilled and completed as producers, is based on 260 workdays per year, and assumes a well life of 30 years and a LOP of 50 years.

² Eight to 15 people are required during fracturing only; assumes only one fracturing crew will be used.

³ Includes three production foreman, 35 pumpers (30 years), three hauler crews, and three field clerks (1_person crews), two rig service crews (3_person crews), and two roustabout crews (4-person crews). Each well location will be visited twice per week on average, and 15-20 wells/locations could be visited daily by a single employee.

⁴ The third workover will generally be for casing and plugging operations associated with well abandonment.

Table F-2.2 Estimated Traffic Requirements¹, Continental Divide/Wamsutter II Natural Gas Project, Sweetwater and Carbon Counties, Wyoming, 1999.

Type of Traffic	Round Trips per Well/Location	LOP Round Trips Required for Maximum Development (x 1,000)
Well Construction/Development		
Access road and well pad construction (5 days/location)	50	150
Gravel hauling	33	99
Rig transport and rig-up operations (4 days/well)	60	180
Drilling activities (20 days/well)	133	399
Completion/testing (15 days/well)	145	435
Pipeline and ancillary facility installation (12 days/location)	48	144
Total Well Construction/Development (56days/location)	469	1,407
ADT ²	8	0.3
Operations/Maintenance		
Operations (LOP) ³	3,120	468
Workovers (10 days every 10years/well)	90	270
Total Operations/Maintenance	3,210	738
ADT ²	0.4	0.1
Total Reclamation (3 days/location)	9	27
GRAND TOTAL	3,688	2,172
ADT²	0.3	0.2

¹ Assumes all wells are drilled and completed as producers, wells produce every day, well life is 30 years, and the LOP is 50 years.

² ADT = average daily traffic.

³ Each well location will be visited twice a week on average, and approximately 15_20well locations could be visited daily by a single employee.

Crews will use a crew vehicle or car pool. Approximately eight round trips per day will be required to each well during construction, drilling, completion, and testing phases (i.e., approximately the first 56 days of development at each well and including ancillary facilities). During production, wells will be visited twice a week on average. An additional three round trips per well per day for a 10-day period every 10 years will generally be required for workovers and well abandonment. Three round trips per day for 3 days will be required for reclamation of each well location.

Project-related traffic will be restricted to I-80, Wyoming Highway 789, Sweetwater County Roads 4_23 and 4_19, other county roads, other improved existing roads in the CD/WIIPA, and newly constructed or upgraded roads developed for the project. Use of unimproved roads will be allowed only in emergency situations. Operators will instruct project personnel and contractors to adhere to speed limits commensurate with road type, traffic volume, vehicle type, and site-specific condition to assure safe and efficient traffic flow. Signs will be placed along roads as directed by the BLM for travel restrictions and other standard traffic control information. All equipment and roads will be maintained to minimize impacts to air quality and noise and to ensure human safety.

F-2.4 WELL PAD CONSTRUCTION

The typical well pad during drilling operations (for vertical, directional, and horizontal drilling operations) will be approximately 2.6 acres (Figure F-2.2). Components of the well pad include a reserve pit to contain drilling fluids, cuttings, and water produced during drilling and a flare pit to be used during testing. All reserve pits will be constructed per BLM and/or WOGCC requirements to protect surface and ground water resources. Site-specific analyses conducted by the BLM during the APD process will determine whether lining of reserve pits with a synthetic liner will be necessary.

Well locations will be cleared of vegetation and topsoil, and these materials will be stockpiled together for future use in reclamation. The well location will be leveled using standard cut_and_fill construction techniques and machinery. At locations with level ground where minimal cut_and_fill is needed and/or where topsoil is saline and/or alkaline and its removal could create depressions capable of retaining water, the topsoil will be stripped only from the pit and spoil stockpile areas to facilitate future reclamation. In areas of rough terrain or where significant erosion/construction hazards exist, detailed engineering designs will be developed by a licensed professional engineer, and construction will be monitored as determined by the BLM. Well pad construction will require approximately 2 days per location, and approximately 20 round trips per location will be needed. Well pad construction crews will usually be contracted locally by the Operators.

Erosion control will be maintained through prompt revegetation and by constructing surface water drainage controls such as berms, diversion ditches, and sediment ponds as necessary at each well location. SWPP Plans will be prepared for all well locations, access roads, and other development sites that disturb more than 5 acres. In some cases, SWPP Plans may be prepared for groups of 20 or more wells.

F-2.5 DRILLING OPERATIONS

Following access road and well pad construction, a rotary drilling rig will be moved to each location and erected on-site. Rig transport and on-site assembly will be completed in approximately 4 days, will involve approximately 15 people per site (Table F-2.1), and will require approximately 60 round trips per site (Table F-2.2).

An estimated maximum of 15 drilling rigs rated to accommodate anticipated final well depths of approximately 7,000 to 11,000 ft will be utilized. Some wells may be drilled to depths greater than 11,000 ft. Whereas vertical drilling will be the principle method employed, directional and/or horizontal drilling methods may be used to augment gas recovery or minimize surface disturbance in areas with sensitive environmental resources. However, directional and horizontal drilling have a greater risk and therefore a lower chance of economic success when compared to vertical drilling. Much of the CD/WIIPA is not well-suited for directional drilling. All drilling operations and other well site activities will be conducted in compliance with applicable BLM, WOGCC, WDEQ, and other relevant federal, state, and county rules and regulations. Most

wells will be completed in the Almond Formation (Mesa Verde Group); however, secondary reserves may be encountered in other formations (e.g., Lewis). Drilling will occur commensurate with new discoveries coupled with anticipated development costs and gas prices.

Drilling will begin in 1999, subsequent to the release of the ROD for this project, and continue until all proposed wells are drilled. Operators propose to drill throughout the year. Drilling each well will take approximately 20 days (some additional time may be required for directional/horizontal wells or wells drilled deeper than 10,000 ft) and will require approximately 21 individuals, including three 5-person rig operations crews necessary to conduct drilling throughout the entire 24-hr day (TableF_2.1). Most project personnel will be hired locally, and all project-required personnel will likely reside in Rock Springs, Wamsutter, or Rawlins. No man camps or other temporary housing is proposed within the CD/WIIPA. Approximately 133 round trips to each well location will be required during drilling operations.

Directional drilling provides for construction of one well location to accommodate as many as five wells. These multiple wells can be serviced by one access road and gathering system pipeline, as well as a single separation, dehydration, and storage facility. Use of multi-well directional drilling techniques will be contingent upon economic, technical feasibility, and environmental considerations.

Horizontal drilling involves drilling a curved section from the bottom of a vertical hole, followed by drilling horizontally in the productive formation. Horizontal drilling could increase gas flows, has been successfully utilized in other gas projects in Wyoming to improve the productivity of marginal wells, and may be applicable in portions of the CD/WIIPA.

Fresh water will be used for drilling the first 5,000 to 7,000ft of each well, and water-based muds will be used for the remainder of the drilling operation. Drilling muds, cuttings, and water will be stored in the reserve pit (FigureF-2.2). The reserve pit will be fenced on the three nonworking sides during drilling, and within 24 hrs after drilling is completed and the rig substructure is removed, the fourth side will be fenced to protect wildlife and livestock until the pit is reclaimed. Reserve pits will be lined to protect surface and ground water resources as directed by the BLM and/or WOGCC during the APD process. In compliance with BLM Informational Bulletin No. WY_93_054, netting (1-inch mesh) will be placed over reserve pits containing oil or other substances toxic to wildlife.

Approximately 630,000 gal of water will be used during the drilling of each well. This water will be obtained primarily from existing and newly drilled water supply wells in the CD/WIIPA. Approximately 50 new water supply wells will be drilled at natural gas well locations, and each water well will require approximately 0.5 acres of long-term (life-of-well) disturbance. Water wells generally will be located one per township, and disturbance associated with water wells will occur within the 2.6-acre initial disturbance area of natural gas well locations. All water supply wells will be permitted with the WSEO and will likely be drilled to depths of less than 1,000ft.

Water will be trucked or piped to individual well locations, depending upon site-specific conditions, disturbance requirements, and time of year. Water pipelines will be temporary and will consist of either standard 3-to6-inch diameter aluminum sections or poly pipe which will be laid on the surface within road ROWs and will be removed upon completion of drilling and completion/testing operations.

When the reserve pit is no longer required, water will be evaporated; however, in some instances, pit contents may be mixed with suitable solid materials and the pit backfilled, as approved by the BLM or private entity. Prior to the mixing of reserve pit contents with approved stabilizing materials, appropriate closure permits will be obtained from the WOGCC/WDEQ. If necessary, reserve pit contents will be removed and disposed of at an approved disposal facility in a manner commensurate with all relevant county, state, and federal regulations and stipulations. The reserve pit area will be recontoured and reseeded as soon as possible (i.e., first appropriate season), but no later than 2 years after completion of drilling and testing operations. Further details on reserve pit reclamation are provided in AppendixA.

Human waste generated at well locations will be collected in standard portable chemical toilets or service trailers and regularly transported off_site to a county_ and state_approved disposal site (e.g., Rawlins or Rock Springs wastewater treatment plants) or otherwise collected and disposed of as authorized by WDEQ. Each well location will be provided with one or more such facilities during drilling and completion operations lasting more than 3 days. A septic system will not be required. Nonhuman waste will be collected in enclosed containers and disposed of at state_approved sites (e.g., Wamsutter landfill).

F-2.6 COMPLETION AND TESTING OPERATIONS

Well completion and testing operations entail:

- isolating near_surface fresh water aquifers with surface casing set at the start of drilling operations;
- casing and cementing various segments of the wellbore to protect fresh water aquifers by running steel pipe into the open borehole and cementing the pipe into place (Figure F-2.3);
- perforating the casing adjacent to the target formation;
- fracture stimulating (fracturing or fracing) the target formation; and
- conducting postfracturing flow tests and cleanup.

Once drilling has been completed, the well will be logged and production casing set to prevent condensates, gas, and/or water movement from reservoir to reservoir and to isolate producing zones, thereby protecting all other zones penetrated by the well. Casing also prevents drill hole cave_in, confines production to the wellbore, and provides a means of controlling pressure to facilitate installation of surface and subsurface well equipment. All well casing and cementing operations on federal minerals will be conducted as directed by the BLM in compliance with BLM Onshore Oil and Gas Order No. 2. Well casing and cementing on state and patented minerals will be as directed by the WOGCC. Completion and testing operations will be similar for all wells, but may require additional time for directional and horizontal wells.

When casing and cementing have been completed, the well casing will be perforated in the producing formation (usually the Almond Formation) to allow the flow of hydrocarbons to the wellbore. Most completions in the CD/WIPA and adjacent areas insert a string of tubing into the casing to the top of the perforated productive zone to allow gas, condensate, and water to flow to the surface where it is collected, measured, and contained.

After perforation, the well will be flowed an estimated 1-15 days to evaluate well performance. During testing, flows from the well, including gas and minor amounts of hydrocarbon liquids (condensates), will be flared to the flare pit pursuant to BLM/WOGCC rules and regulations (NTL_4A). Depending on the rates of these flow tests, the formation will be further evaluated for fracture stimulation. Flaring will also occur during flowback operations following fracturing.

Hydraulic fracturing is expected to be performed on most wells to increase gas flow rates by increasing the relative formation permeability. Nitrogen (N₂) or carbon dioxide (CO₂), water_based fluids, and proppants (i.e., granular materials such as sand) are pumped down the wellbore under high pressure and through perforations in the casing into the target formation. The pressurized fluid induces hydraulic fractures in the formation and, when the pressure is released, fluids return to the surface and the fractures partially close on the proppants, leaving channels for gas and liquids to flow into the wellbore. Fracturing fluids returned to the surface will be captured in temporary storage tanks or BLM_approved earthen pits. Fluids will either be evaporated on_site, hauled away from the location for reuse, or disposed of at an authorized facility. Decisions regarding the appropriate handling of fracturing fluids will be made by the BLM and/or WOGCC on a case_by_case basis.

Approximately 138,000 gal (0.42 acre_ft) of water per well will be needed for completion and testing operations. The total per well water requirement for all drilling, completion, and testing operations will be approximately 768,000 gal (2.4 acre_ft). Maximum LOP water requirements will be 2,304 million gal (7,072 acre_ft).

Estimated employment and traffic requirements necessary for completion and testing operations are presented in Tables F-2.1 and F-2.2, respectively. Typical completion and testing operations will take approximately 15 days per well and

require a daily average of 11 individuals. Total round trips per well required for completion and testing operations are estimated at 145.

F-2.7 PRODUCTION FACILITIES

Once a well has been tested and deemed to be commercially productive, it will be equipped for production. Figure F-2.4 shows a typical single well location production facility. Reclamation of areas unnecessary for production operations--approximately 1.8 acres at each well location--will be completed, reducing disturbance at each location to approximately 0.8 acres for the LOP. Multiple well location production facilities will not vary substantially in size from a single well facility; however, locations with water wells will have approximately 1.3 acres of disturbance for the LOP. All aboveground production facilities at each location will be painted with standard environmental colors (e.g., Carlsbad Canyon) that blend with the surrounding landscape.

A series of valves designed to control pressures and regulate flows from the well (i.e., the christmas tree) will be installed at the well head. Flows from the wellbore will pass through the christmas tree to a separator where the gas will be separated from the condensates and water in the gas stream. Liquids will be diverted to storage tanks. Water remaining in the natural gas stream will be removed with a skid-mounted glycol dehydration system (i.e., dehydrator) and routed to an appropriately protected collection container. Natural gas will be directed to a collection or gathering system pipeline.

Natural gas production from wells in the CD/WIIPA is expected to range from approximately 0.25 to greater than 3.5 million cubic feet (mmcf) per day (mmcf/d). Table F-2.3 shows the typical content of gas produced from the Almond Formation in fields adjacent to the CD/WIIPA. No hydrogen sulfide (H₂S) is known from this formation, and none is expected to be encountered during project operations.

From less than 5 to 350 barrels (bbls) of condensate per day (bcpd) are expected to be produced from each well. Condensates consist primarily of long chain hydrocarbon liquids (e.g., pentanes, hexanes, heptanes, octanes) and will be stored in tanks at well locations (Figure F-2.4). In compliance with 43 C.F.R. 3262 and 40 C.F.R. 112.7, all tank batteries will be bermed to contain the volume of the largest tank plus sufficient freeboard (5 ft) to handle precipitation. Condensates will be periodically removed from storage tanks and transported by truck for sale to refineries or piped to central processing facilities. Condensate will be transported from locations as necessary based upon production rates. It is anticipated that on average condensates will be transported from locations twice a month.

Table F-2.3 Typical Gas Composition from the Almond Formation in Fields in and Adjacent to the Continental Divide/Wamsutter II Natural Gas Project, Sweetwater and Carbon Counties, Wyoming, 1999.

Component	Creston/Blue Gap (%)	Greater Wamsutter Analysis Area (%)
Methane	85.98	81.54
Ethane	6.94	8.42
Carbon dioxide	3.15	3.24
Propane	2.40	4.16
Butane	0.52	0.84
Isobutane	0.46	0.87
Nitrogen	0.25	0.25
Isopentane	0.14	0.22
Pentane	0.13	0.17
Hexanes	0.03	0.18
Heptanes	0.00	0.08
Octanes	0.00	0.03
Total	100.00	100.00

¹ Adapted from BLM (1994a, 1995a).

The volume of water produced at each well is expected to be less than 20 bbls per day and will average approximately 6 bbls per day. Water initially removed from the gas stream will be stored in a tank at the well location. The quality of this water will be variable. Water will be removed as necessary from the tank and transported by vacuum truck for disposal in permitted facilities according to WDEQ rules and regulations and BLM Onshore Oil and Gas Order No. 7.

All producing wells will be visited from one to five times each week for routine well operations. On average, each well location will be visited twice a week. The estimated employment requirements for well operations are presented in Table F-2.1 and traffic requirements are presented in Table F-2.2. The productive life of wells in the CD/WIIPA is expected to be from 5 to 30 years.

F-2.8 PIPELINES

Most gas produced from wells will be transported from each location through newly constructed underground gathering system pipelines. These lines will be linked to larger existing interstate gas transportation pipelines in the CD/WIIPA. At present, it is assumed that existing interstate pipeline capacity will be adequate for the gas transportation needs required for this project. In the event that additional interstate pipelines become necessary, additional NEPA analyses will be conducted.

The exact location of newly proposed pipelines cannot be determined at present; however, industry standard pipeline equipment, materials, techniques, and procedures in conformance with all applicable regulatory requirements will be employed during construction, testing, operation, and maintenance of pipelines to ensure the safety and efficiency of pipelines in the CD/WIIPA. Depending upon the location of acceptable pipeline tie-ins, pipeline ROWs will be located adjacent to roads to minimize surface disturbance and maximize construction and gas transport efficiency (Figure F_2.1). However, pipelines may not follow roads based on environmental and/or economic considerations.

Pipeline ROW widths generally will be 50 ft, and an estimated 0.5-1.5 mi of pipeline will be required for each well on the CD/WIIPA. An average of approximately 1.5 mi of new pipeline will be required for each well during initial field development; however, in developed areas and as development proceeds in other areas, it is estimated that on average only 0.5 mi of pipeline will be required per well. New gas pipelines generally will be 36 inches in diameter and buried to depths of 4-6 ft. To provide additional protection of visual, habitat, and/or subsurface resources and to minimize surface disturbance, pipelines may be located aboveground in some areas.

Sufficient topsoil to facilitate reclamation will be removed from pipeline ROWs before construction. Where ROWs do not require major excavation, vegetation may be stripped to ground level (scalping) using mechanical treatments, leaving topsoil intact and minimizing disturbance to plant root systems, thereby facilitating vegetation reestablishment. All pipeline ROW reclamation will be initiated as soon as practical following disturbance, but will be completed within 2 years.

Hydrostatic testing will be utilized to ensure the integrity of newly constructed pipelines. This testing consists of filling pipeline segments with water and pressurizing the segments to levels exceeding operating pressures. If leaks or ruptures occur, they will be repaired and testing will be repeated until successful. Water used for hydrostatic testing will either be produced water or water acquired from WSEO-permitted ground water wells. After testing, this water will be pumped into tank trucks and reused for drilling or further pipeline testing, thereby avoiding the discharge of water on the ground surface. In some instances, produced water used for testing may be hauled to existing approved disposal facilities.

Pipeline construction crews of approximately six persons will install an average of 850 ft of line per day (Table F-2.1), and a 1.0 mi pipeline segment will require 6-7 days to complete. Approximately 3.0 acres of short-term disturbance will be required per mile of pipeline.

F-2.9 ANCILLARY FACILITIES

The proposed project will utilize existing compression, processing, water disposal, water well, and power line facilities to the maximum extent possible. Up to five compressor stations, one gas processing plant, 10 water evaporation ponds, five water disposal wells, and 50 water wells may be required as the field is developed. The exact locations of these facilities has not been determined; however, they will be situated and designed to minimize environmental impacts and maximize operations efficiency. Total maximum surface disturbance from ancillary facilities would be 144 acres for the LOP.

Compression facilities will require a maximum of 4.0 acres each, and a maximum of five facilities will be required. Engines on the compressors will be fueled by natural gas and designed to minimize emissions, and typical stack height will be 24 ft. A total of 70,000 horsepower (hp) of compression may be required at four compression facilities spaced throughout the CD/WIIPA and at a facility located with the gas processing facility. Compression facilities will not be manned but will be lighted 24hrs per day.

One natural gas processing facility may be required, or an expansion to an existing processing facility may occur. The processing plant will be permitted and constructed by gas gathering companies and will be designed for dehydration, CO₂ removal, condensate removal, and cryogenic natural gas liquid condensation/extraction. A typical processing plant and associated ROWs will require approximately 30 acres. During initial development, existing processing at Wamsutter will be utilized and no new processing plants will be required; however, under maximum development (3,000 well locations), a new gas processing facility will be necessary.

Additional water disposal facilities may include a maximum of 10 evaporation ponds (3.4 acres surface disturbance per pond and 34 acres total surface disturbance) and five disposal wells (7 acres surface disturbance per disposal well and 35 acres total surface disturbance). Approximately 50% of water disposal will be by evaporation ponds and 50% by disposal wells. The exact location of these facilities has not been determined; however, evaporation ponds will be located off federal surface, will be permitted by WDEQ, and will be designed to minimize adverse environmental impacts and maximize operation efficiency. Evaporation ponds will generally consist of a 6-ft deep, 3.0-acre pit (350 x 350 ft), bermed to allow 3 ft of freeboard with an associated bermed tank farm. Pits will be clay-, clay/bentonite-, or geomembrane-lined and will have a leak detection system. Disposal wells will be 4,000-12,000 ft deep (Fox Hills and Almond Formations) and will be permitted by the WSEO, WOGCC, and/or WDEQ.

Fifty new water wells may be drilled to provide water for drilling. Water wells will be approximately 400 to 1,000 ft deep and will be situated at gas well locations, and each well will result in an additional 0.5 acres of LOP disturbance at natural gas well locations. Each water well will be permitted by the WSEO. After drilling is completed, water wells could be: 1) left for the landowner to file a water right; 2) capped for future use by Operators; or 3) plugged and abandoned.

Aggregates to be used for road and well location construction will be acquired from suitable areas on federal, state, and private lands on and adjacent to the CD/WIIPA. Prior to aggregate extraction, appropriate permits will be obtained from the WDEQ Land Quality Division (LQD) and federal sources as necessary. Site-specific NEPA documents will be required for aggregate extraction operations on federal lands. Further detail on the location of potential aggregate sources and the need for these materials is provided in the TPTSD for this project (BLM 1999a).

F-2.10 GEOPHYSICAL OPERATIONS

Geophysical operations (i.e., seismic surveys), including 3-D surveys, velocity surveys, normal incident vertical seismic profiles, and/or offset vertical seismic profiles may be required during the LOP as drilling activity increases into areas of the CD/WIIPA with marginal or unknown gas reserves. The majority of these surveys will likely utilize 3-D seismic techniques and employ vibrator trucks or shothole methods. These surveys will be subject to separate environmental analyses for compliance with NEPA and are expected to cause minimal surface disturbance. Cultural resource inventories and other surveys for sensitive environmental

resources will be conducted prior to implementation as directed by the BLM. Any geophysical operations conducted as a result of the project will be implemented using procedures specified in the BLM's GDRA and GRRR RMPs after receipt of BLM and/or WOGCC approval.

Geophysical exploration generally involves the use of an energy source (i.e., vibrator trucks or shotholes), geophones/receivers (listening devices), and computer processing equipment (recorder truck). Receivers are arranged in a grid pattern, with receiver line spacing usually 0.25 mi apart and geophone spacing at 220_ft intervals along the line. Energy source lines are generally 0.5 mi apart, with vibrating or shothole points at 220_ft intervals along the line. Shotholes are usually less than 250 ft deep, with diameters of 3.5_8.4inches. Trucks ranging in size from the 26-ton vibrator trucks to 1-ton pickups will access lines using existing roads and cross_country travel. Backtracking will be kept to a minimum, and all_terrain vehicles (ATVs) and/or helicopters will be used to transport personnel and equipment in difficult terrain or areas designated as sensitive to vehicular traffic. Observation of recent 3_D geophysical operations conducted in similar areas show no long_term damage to vegetation and soils.

F-2.11 HAZARDOUS MATERIALS

The Operators have reviewed the EPA's Consolidated List of Chemicals Subject to Reporting Under Title III of the *Superfund Amendments and Reauthorization Act of 1986* (SARA) (as amended) to identify any hazardous substances proposed for production, use, storage, transport, or disposal by this project, as well as the EPA's List of Extremely Hazardous Substances as defined in 40 C.F.R. 355 (as amended), and have determined that materials listed as hazardous and/or extremely hazardous will be used or generated by this project (see AppendixC).

Hazardous materials anticipated to be used or produced during the implementation of the proposed project generally can be included in the following categories: drilling materials, casing and cementing materials, fracturing materials, production products, fuels, combustion emissions, and miscellaneous materials.

Operators and their contractors/subcontractors will comply with all applicable hazardous material laws and regulations and will locate, handle, and store hazardous substances in an appropriate manner to prevent them from contaminating sensitive resources.

Notice of any spill or leakage, as defined in BLM NTL 3A, will be immediately reported by the Operator to the BLM and other federal and state officials (e.g., WDEQ) as required by law. Incidents requiring verbal notification by regulation will be given as soon as possible, but no later than 24 hrs after the discovery of the incident. Verbal notification will be confirmed in writing within 15 days or other such time required by the appropriate regulatory agency. Any release of hazardous substances (leaks, spills, etc.) in excess of the reportable quantity, as established by 40 C.F.R. 117, will be reported as required by the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*, (CERCLA) as amended (42U.S.C.9601 et seq.). If the release of a hazardous substance in a reportable quantity does occur, a copy of the report will be furnished to the BLM and all other appropriate federal and state agencies.

Each Operator will also prepare and implement, as necessary, the following plans and/or policies:

- pursuant to 40 C.F.R. 112, Spill Prevention, Control, and Countermeasure (SPCC) Plans prepared for those sites where SPCC Plans are applicable;
- Spill Response Plans (oil/condensate);
- plans and inventories of hazardous chemical categories pursuant to Section312 of SARA, as amended; and
- Emergency Response Plans.

Copies will be maintained with the Operators, as required by regulation, and will be made available for review upon request.

F-2.12 OPERATIONS AND MAINTENANCE**F-2.12.1 Maintenance**

All roads, wells, pipelines, and ancillary facilities will be operated in a safe and efficient manner according to industry standards. Routine maintenance of producing wells will be necessary to maximize performance and detect potential difficulties. Typically, each well location will be visited once or twice a week to ensure operations are proceeding efficiently. All roads and well locations will be inspected periodically by the BLM and maintained by Operators to minimize erosion and assure safe operating conditions. Work force and traffic requirements for project operations are presented in Tables F-2.1 and F-2.2, respectively.

F-2.12.2 Workovers

Approximately once every 10 years, each well will require a workover to change or replace tubing, re_fracture producing formations, clear water and other debris from the wellbore and perforations, and/or recomplete the well in another potentially productive zone not completed at the time the well was first drilled. While some wells may never require workovers and others may need workovers more than once every 10 years, wells will generally require three workovers each, and the third workover will be conducted at well abandonment. On average, workovers will require a crew of seven workers for 10 days (Table F-2.1) and approximately 30 round trips (Table F-2.2). Workovers will be conducted primarily during daylight hours, and the BLM will be consulted prior to initiating workovers (e.g., Sundry Notice) on federal lands in crucial wildlife areas during critical periods.

F-2.13 RECLAMATION AND ABANDONMENT

Reclamation will be conducted on all disturbed lands in compliance with BLM's *Wyoming Policy on Reclamation* (BLM 1990b), and the reclamation guidelines presented in AppendixA. Erosion control, restoration, and revegetation plans will be prepared by Operators on a site_specific basis during the APD and ROW application process, and these plans will be approved by the BLM prior to site

disturbance. The short_term reclamation goal will be to stabilize disturbed areas as rapidly as possible, whereas the long_term goal will be to return the land to conditions approximating those which existed prior to disturbance.

Reclamation will occur during two phases. After production facilities are installed, reclamation will be initiated on unnecessary portions of productive well locations (approximately 1.8 acres/location) and road ROWs to these locations (approximately 11.5ft along each side of the road). Reclamation of all disturbed surface areas along pipeline ROWs will also be initiated. These reclamation activities will begin as soon as practical following disturbance (e.g., the first appropriate season), and reclamation, including grading, ripping, retopsoiling, and reseeding, will be completed within 2 years. This initial reclamation will reduce the amount of disturbed area to that necessary for production operations.

When an Operator is ready to abandon a well, an abandonment plan will be submitted to BLM, and if acceptable, the BLM will approve and authorize activities through a Sundry Notice. The well will be plugged according to BLM Onshore Oil and Gas Order No. 2 or WOGCC rules and regulations (WOGCC 1998). Figure F-2.3 shows a typical plugged and abandoned wellbore schematic. Reclamation for all abandoned or shut_in well locations and access roads will be initiated as soon as practical, according to BLM specifications, and reclamation activities will be completed within 2 years. This reclamation will include leveling and recontouring of disturbed areas, soil ripping, redistribution of topsoil over disturbed areas, installation of water diversion and/or erosion control devices, and reseeding. Reclamation will follow guidelines presented in AppendixA and specified in APD Surface Use Plans and/or ROW Plans of Development.

At the end of the project's useful life (estimated at 30_50 years), Operators will obtain all necessary authorizations from the appropriate regulatory agencies and/or landowners to abandon facilities. All aboveground facilities will be removed, and all unsalvageable materials will be disposed of at authorized sites. Wells will be permanently or temporarily plugged or shut_in, according to BLM and/or WOGCC recommendations (Figure F-2.3). Pipelines will be purged of combustible materials and abandoned in place or removed, based on authorizing agency or landowner specifications. The well pad will be reclaimed and revegetated as outlined in AppendixA and site_specific APD Surface Use Plans. Roads will be reclaimed according to procedures identified in AppendixA and/or ROW Plans of Development, unless they are determined to be left in place by the authorizing agency or private landowner. Any excess topsoil from roads that will not be reclaimed will be used to reclaim well pads. Regrading, ripping (12 to 18 inches), topsoiling, and revegetation will be completed. Proposed seed mixtures (AppendixA), as approved by the BLM, will be broadcast or drill seeded. Reclaimed and abandoned locations and ROWs will revert to appropriate agency or landowner control.

F-3.0 APPLICANT-COMMITTED MITIGATION/ ENVIRONMENTAL PROTECTION MEASURES

The following applicant_committed mitigation measures, design features, and procedures will be implemented by Operators to minimize impacts to the environment. Each mitigation measure is listed only once, under the first resource where it applies; however, many mitigation measures apply to several resources and will help reduce impacts to each. Mitigation measures may be waived when deemed inappropriate by the BLM if a thorough analysis determines that the resource(s) for which the measure was developed will not be impacted. Further site_specific mitigation measures will be identified during APD and ROW application review processes. To assure compliance with mitigation measures, each Operator will provide a qualified individual on-site during construction/drilling operations. This individual will consult with the BLM on a case_by_case basis as necessary during field development.

All of the proposed applicant_committed mitigation/ environmental protection measures identified in this section will be implemented on all federal lands in the CD/WIIPA. Implementation of these measures on state and private lands will be subject to state or landowner preferences and agreements with individual Operators, and where these measures are not implemented, additional impacts may occur. Development activities on all lands will be conducted in accordance with all appropriate federal, state, and county laws, rules, and regulations.

F-3.1 PRECONSTRUCTION PLANNING AND DESIGN MEASURES

1. Operators and the BLM will conduct on_site interdisciplinary team (IDT) inspections of each proposed disturbance site (e.g., well sites, roads, pipelines, etc.) to develop site_specific recommendations and mitigation measures.
 2. Operators will adhere to the specifications, guidelines, and development protocol identified in the TP for this project (ROD AppendixB). Annual updates to the TPTSD will be prepared by Operators and approved by the BLM prior to the initiation of any road improvement/ construction (see ROD AppendixB and BLM 1999). The road construction and maintenance agenda and the responsible Operators will be updated annually in the TPTSD to accommodate tentative developments proposed for the next calendar year. Proposed maintenance and development plans will be reviewed annually by the BLM, Operators, landowners, and the Carbon County and Sweetwater County Road Departments. Roads on federal lands required for the proposed project will be constructed in accordance with BLM Manual 9113 guidelines (BLM 1985, 1991).
 3. Operators will prepare and submit individual drill-site design plans to the BLM for approval prior to initiation of construction. These plans will show the layout of the well location over the existing topography, dimensions of the pad, volumes and cross sections of cut_and_fill, location and dimensions of reserve and flare pits, and access road design.
 4. Prior to construction, operators will submit a Surface Use Plan or a Plan of Development for each well site, pipeline segment, and access road project. These plans will detail the measures and techniques to be used for erosion control, revegetation, and restoration and will adhere to reclamation guidelines presented in ROD AppendixA. The plan will provide specific detail on project administration, time frames, responsible parties, objectives, characteristics of site predisturbance conditions, topsoil removal, storage and handling, runoff and erosion control, seed bed preparation, seed mixes, seed application, fertilization, mulching, site protection, weed and livestock or other herbivore control, and monitoring and maintenance.
 5. Detailed engineering will be conducted for construction activities on steep and/or unstable slopes when required by the BLM and will receive approval by the BLM prior to initiating construction.
 6. Operators will identify aggregate and other surfacing material sources, for use in drill site and road
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construction, in annual updates to the TPTSD (BLM 1999). The appropriate surface management agency (usually the State of Wyoming) will approve these sources, including timing for extraction, prior to use.

F-3.2 AIR QUALITY

1. All BLM conducted or authorized activities (including natural gas development alternatives) must comply with applicable ambient air quality regulations and standards. Operators will adhere to all applicable Wyoming Ambient Air Quality Standards (WAAQS), National Ambient Air Quality Standards (NAAQS), and permit requirements (including preconstruction, testing, and operating permits), motorized equipment and other regulations, as required by the Wyoming Department of Environmental Quality (WDEQ)_Air Quality Division (AQD).
2. Operators will not allow open burning of garbage or refuse at well locations or other facilities in the CD/WIIPA. Any other open burning will be conducted under the permitting provisions of Section 13 of the Wyoming Air Quality Standards and Regulations (WDEQ-AQD 1989).
3. On federal land and during times of high use (i.e., construction, drilling, and workover operations), Operators will initiate immediate abatement of fugitive dust (by application of water, chemical dust suppressants, or other measures) when air quality, soil loss, or safety concerns are identified by the BLM or the WDEQ_AQD. These concerns include but are not limited to potential exceedances of applicable air quality standards. The BLM will approve control measures, locations, and application rates. If watering is the approved control measure, Operators will obtain the water from state_approved sources.

F-3.3 TOPOGRAPHY AND PHYSIOGRAPHY

1. Operators will incorporate in their Surface Use Plans and Plans of Development the reclamation procedures and specifications contained in *Standard Practices Applied to Surface_Disturbing Activities* (BLM 1992:Appendix7_2), the Reclamation Plan for this project (ROD AppendixA), and guidelines for road construction contained in BLM Manual, Section 9113 (BLM 1985, 1991), TP (ROD AppendixB), and TPTSD (BLM 1999).
2. Areas with high erosion potential and/or rugged topography (i.e., steep slopes [$>25\%$], stabilized sand dunes, flood plains, erosive and sandy soils) will be avoided where possible, or specialized mitigation measures to control erosion will be applied.
3. Upon completion of construction and/or production activities, Operators will restore the topography to near pre_existing contours at well sites, access roads, pipelines, and other facility sites.

F-3.4 GEOLOGICAL/PALEONTOLOGICAL RESOURCES

1. Geologic risks will be minimized by implementing site_specific alignment variations for roads, pipelines, and drill pads to avoid and/or minimize disturbances to unstable areas.
 2. BLM/WOGCC casing and cementing criteria will be followed to protect all subsurface mineral- and water_bearing zones.
 3. If paleontological resources are discovered by Operators or any person working on their behalf, at any time during construction, construction activities that could potentially disturb these resources will cease and the BLM will be notified immediately. In compliance with paleontological resource management guidelines (BLM 1998a, 1998b), the BLM will arrange for a determination of significance and, if necessary, recommend a recovery or avoidance plan. Mitigation of paleontological resources will be on a case_by_case basis, and the Operator will incur all costs. Surface_disturbing activity will not resume until a Notice to Proceed is issued by the BLM.
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F-3.5 SOILS

1. Prior to commencement of well location construction, all available topsoil (up to 12 inches) will be stripped from cut, fill, stockpile, and pit areas, and salvaged topsoil will be stockpiled for future reclamation operations.
2. Operators will keep the area of disturbance to the minimum necessary for drilling activities and subsequent production activities while providing for safety.
3. Operators will restrict off_road vehicle activity by employees and contract workers.
4. Operators will restrict project_related travel during periods when soils are saturated and excessive rutting (e.g., >4 inches) could occur.
5. Where feasible, Operators will locate pipelines immediately adjacent to roads or other pipelines to avoid creating separate areas of disturbance.
6. Operators will minimize construction activities in areas of steep slopes (e.g., >25%) and sand dunes and will apply special slope-stabilizing structures and techniques in accordance with applicable geotechnical data (e.g., mulch, revegetation) if construction cannot be avoided in these areas.
7. Operators will not conduct construction activities using frozen or saturated soils, unless an adequate plan is submitted and approved by the BLM that demonstrates potential impacts will be mitigated.
8. Operators will minimize disturbance to vegetated cuts-and-fills on new and existing roads.
9. Runoff and erosion control measures such as water bars, berms, and interceptor ditches will be installed as necessary (see ROD AppendixA).
10. All drainage crossing structures will be designed to carry at least a 10_year/24_hr storm event, pursuant to guidelines in BLM Manual, Section 9113 (BLM 1985, 1991).
11. Operators will replace topsoil or suitable growth materials over all disturbed surfaces prior to revegetation.
12. Operators will revegetate all disturbed sites as soon as practical following disturbance (see ROD AppendixA).

F-3.6 WATER RESOURCES

1. Construction at drainage crossings will be limited to periods of low or no flow.
 2. Operators will follow all practical alternatives and designs to limit disturbance within drainage channels, including ephemeral and intermittent draws.
 3. Channel crossings by pipelines will be constructed so that the pipe is buried at least 4 ft below the channel bottom.
 4. Channel crossings by roads and pipelines will be constructed perpendicular to flow.
 5. Disturbed channel beds will be reshaped to their approximate original configuration.
 6. All disturbances to wetlands and/or waters of the U.S. will be coordinated with the U.S. Army Corps of Engineers (COE), and Section 404 permits will be secured as necessary prior to disturbance.
 7. A 500_ft wide buffer area of undisturbed land will be left between construction sites and perennial channels or open water areas.
 8. A 100_ft wide buffer area of undisturbed land will be left between construction sites and ephemeral and intermittent channels.
 9. All reserve pits will be constructed in cut or stabilized fill material.
 10. Subsurface material at all reserve pits will be inspected by BLM as deemed necessary during construction to assess stability and permeability to determine the need for pit reinforcement or lining. If directed by the BLM and/or the WOGCC, a synthetic liner will be installed.
 11. Reserve pits that contain materials potentially hazardous to the environment (see ROD AppendixC and BLM [1998c]) will be lined if they are located at sites where ground water occurs within 20 ft of the surface or where potential ground or surface water could be contaminated.
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12. If reserve pit leakage is detected, reserve pit use at the site will be curtailed, as directed by the BLM, until the leakage is corrected.
 13. All reserve pits will be designed with at least 1.0-ft of free board.
 14. All water used in association with this project will be obtained from Wyoming State Engineer's Office (WSEO)_permitted ground water wells.
 15. The discharge of all water (storm water, produced water) will be done in conformance with WDEQ_Water Quality Division (WQD), BLM, and WOGCC rules and regulations (WDEQ 1978; BLM Onshore Oil and Gas Order No. 7).
 16. Concentrated water flows within access road ROWs will be managed utilizing best management practices as described in ROD AppendixA.
 17. Operators will prepare SWPP Plans for all disturbances greater than 5acres in size as required by WDEQ National Pollutant Discharge Elimination System (NPDES) permit requirements. In some instances, SWPP Plans for groups of wells may be developed.
 18. Operators will implement Spill Prevention Control and Countermeasure (SPCC) Plans, where applicable, in accordance with 40*Code of Federal Regulations* (C.F.R.) 112.
 19. BLM/WOGCC casing and cementing criteria will be followed to protect all subsurface mineral- and water_bearing zones.

F-3.7 NOISE AND ODOR

Operators will ensure that all motorized equipment is muffled and maintained.

F-3.8 VEGETATION

1. Operators will finance site_specific surveys for federally listed threatened and endangered (T&E), candidate, and proposed plant species and plant species of special concern (former U.S. Fish and Wildlife Service (USFWS) Category 2 candidate species) prior to any surface disturbance in areas determined by the BLM to contain potential habitat for such species (BLM Directive U.S. Department of Interior [USDI]_BLM 6840). These surveys will be completed by a qualified botanist as authorized by the BLM, and this botanist will be subject to BLM's special status plant survey policy requirements. Data from these surveys will be provided to the BLM, and if any T&E, candidate, proposed, or special status plant species or their habitats are found, BLM recommendations for avoidance or mitigation will be implemented. Minor relocation of project facilities will be made to avoid these species and/or their habitat. If avoidance is not possible, informal consultation with the USFWS will be initiated, as necessary.
 2. Herbicide applications will be kept at least 500 ft from known special status plant populations.
 3. Removal or disturbance of vegetation will be kept to a minimum through construction site management (e.g., by utilizing previously disturbed areas, using existing ROWs, designating limited equipment/ materials storage yards and staging areas, scalping, etc.).
 4. Operators will seed and stabilize disturbed areas in accordance with the reclamation guidelines presented in ROD AppendixA.
 5. Operators will monitor for noxious weeds and will apply BLM_approved weed control techniques (e.g., soil sterilants, biological controls), as necessary.
 6. Operators will evaluate all project facility sites for occurrence of waters of the U.S., special aquatic sites, and wetlands, per COE requirements. All project activities will be located outside of these sensitive areas, where practical.
 7. Where wetlands, riparian areas, streams, and ephemeral/intermittent stream channels must be disturbed, COE Section404 permits will be obtained as necessary, and the following measures will be employed.
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- a. Wetland areas will be crossed during dry conditions (i.e., late summer, fall, or dry winters); winter construction activities will occur only prior to soil freezing or after soils have thawed.
- b. Streams, wetlands, and riparian areas disturbed during project construction will be restored to pre_project conditions, and if impermeable soils contributed to wetland formation, soils will be compacted to reestablish impermeability.
- c. Wetland topsoil will be selectively handled.
- d. Recontouring and BLM_approved species will be used for reclamation.
- e. Reclamation activities will begin on disturbed wetland areas immediately after completion of project activities.

F-3.9 WILDLIFE AND FISHERIES

- 1. Operators will support and implement activities as defined in the Wildlife Protection Plan for this project (see ROD AppendixD).
 - 2. Operators will not perform construction activities in big game crucial winter ranges from November 15 to April 30, unless specifically allowed by the BLM.
 - 3. Wildlife_proof fencing will be constructed around areas that could be potentially hazardous to wildlife (e.g., reserve pits, toxic material storage locations) as deemed necessary by the BLM.
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4. Wildlife_proof fencing will be utilized on reclaimed areas if it is determined that wildlife species are impeding successful vegetation establishment.
 5. Reserve, workover, and evaporation/ production pits potentially hazardous to wildlife will be adequately protected (e.g., fenced, netted) to prohibit wildlife access as directed by the BLM and to ensure protection of migratory birds and other wildlife.
 6. ROW fencing associated with this project will be kept to a minimum, and if necessary, fences will meet BLM and Wyoming Game and Fish Department (WGFD) approval for facilitating wildlife movement.
 7. Operators will implement policies designed to control poaching and littering and will notify all employees (contract and company) that conviction of a major game violation could result in disciplinary action. Contractors will be informed that any intentional poaching or littering within the CD/WIIPA could result in dismissal.
 8. Operators will internally enforce existing drug, alcohol, and firearms policies.
 9. Any power line construction will follow recommendations by the Avian Power Line Interaction Committee (APLIC) (1994, 1996) and Olendorff et al. (1981) to avoid collisions and electrocution of raptors and other avifauna.
 10. USFWS and WGFD consultation and coordination will be conducted as necessary for all mitigation activities related to raptors and T&E species (and their habitats), and all permits required for movement, removal, and/or establishment of raptor nests will be obtained.
 11. Proposed disturbance within 1.0 mi of identified raptor nests will be surveyed by a qualified biologist to determine activity status prior to commencement of drilling and construction during raptor nesting periods. If an active raptor nest is identified within 0.25 to 1.0 mi (depending upon species and line of sight) of a proposed site, Operators will restrict construction during the critical nesting season for that species.
 12. Operators will not conduct surface-disturbing activities within 0.25 mi of active sage grouse leks.
 13. Operators will limit construction activities between March 1 and June 30 within a 2.0_mi radius of active sage grouse leks on suitable sage grouse nesting habitat as determined during on_site reviews of proposed development areas.
 14. Site_specific surveys for federally listed T&E, candidate, and proposed animal species and animal species of special concern will be conducted prior to surface disturbance in areas determined by the BLM to contain potential habitat for such species. These surveys will be completed by a qualified biologist as authorized by the BLM. Data from these surveys will be provided to the BLM, and if any T&E, candidate, proposed, or special status animal species or their habitats are found, BLM recommendations for avoidance or mitigation will be implemented. Minor relocation of project facilities will be made to avoid these species and/or their habitats. If avoidance is not possible, informal consultation with the USFWS will be initiated, as necessary.
 15. Mountain plover habitats (e.g., cushion plant communities, playa lakes, areas with vegetation <4 inches in height) will be avoided where practical, and where these habitats will be disturbed, reclamation will utilize procedures designed to re-establish suitable plover habitat as directed by the BLM. Furthermore, mountain plover surveys will be conducted within suitable plover habitat on the CD/WIIPA by a qualified biologist in accordance with USFWS guidelines and as directed by the BLM. The survey procedures will include the following.
 - Visual observation of areas within 656ft (200 m) of proposed disturbance will be made from stationary vehicles and/or all-terrain vehicles (ATVs) to detect the presence of plovers. All plovers located will be observed long enough to determine if a nest is present.
 - Surveys will be conducted no more than 14 days prior to the date actual ground_disturbing activities begins. If two surveys are required, they will be made at least 14 days apart, with the last survey no more than 14 days prior to the start_up date.
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- Surveys will be required by the BLM to clear an action for mountain plovers prior to beginning a planned activity, and surveys will be conducted during the period of April 15-June 30 for development activities planned during this period.
 - If an active plover nest is found in the survey area, the planned activity will be delayed at least 37 days or 1 week post_hatching. If a brood of flightless chicks is observed, activities will be delayed at least 7 days.
 - Road construction and maintenance (i.e., grading) activities will be minimized from May 25 to June 30.
 - Where practical, no new surface_disturbing activities will be conducted from April 1 to June 30 within 656 ft of identified mountain plover concentration areas (i.e., areas where broods and/or adults have been observed in the current year or documented in at least 2 of the past 3 years).
 - Where access roads and/or well locations have been constructed prior to the mountain plover nesting season and use of these areas has not been initiated for development actions, the BLM will require site investigations of these disturbed areas prior to use to determine whether mountain plover are present. In the event mountain plover nesting is occurring, the BLM may require delays in development activities until nesting is complete.
16. Where prairie dog colonies will be disturbed, operators will consult with the USFWS and/or the BLM and BLM will initiate informal consultation with the USFWS to determine if black_footed ferret searches are required. When ferret searches are required, they will be conducted in accordance with USFWS guidelines (USFWS 1989).
 17. Where possible, proposed disturbance areas will avoid prairie dog colonies which meet black_footed ferret habitat size and burrow density criteria (USFWS 1989).
 18. No surface water or shallow ground waters in connection with live surface waters will be utilized for the proposed project.
 19. Pursuant to the *Endangered Species Act*, Operators will adhere to all survey, mitigation, and monitoring requirements identified in the Biological Assessment (BA) for this project (see ROD AppendixE).

F-3.10 CULTURAL AND HISTORIC RESOURCES

1. Operators will adhere to the Section 106 compliance process (36C.F.R.800) or National Cultural Programmatic Agreement (NCPA) and Wyoming State Protocol (WSP) prior to any surface-disturbing activity.
 2. Operators will halt construction activities in potentially affected areas if previously undetected cultural resource properties are discovered during construction. The BLM will be immediately notified, consultation with the Wyoming State Historic Preservation Office (SHPO) and Advisory Council will be initiated as necessary, and proper mitigation measures will be developed pursuant to the WSP under the NCPA, or 36C.F.R.800.11. Construction will not resume until a Notice to Proceed is issued by the BLM.
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3. Provisions similar to those of the *Oregon/Mormon Pioneer National Historic Trails Management Plan* (BLM 1986) or newly developed cultural resource management plans will be followed for any actions potentially affecting the Overland Trail, Cherokee Trail, and/or Lincoln Highway.
 4. Operators will pay the costs of BLM-required mitigation for cultural resources.

F-3.11 SOCIOECONOMICS

Operators will implement hiring policies that encourage the use of local or regional workers.

F-3.12 LIVESTOCK/GRAZING MANAGEMENT

1. Operators will coordinate project activities with ranching operations to minimize conflicts with livestock movement or other ranch operations.
2. Operators will maintain all fences, cattle guards, and other livestock-related structures required for their transportation network.
3. In areas of high livestock use, reclaimed area fencing will be utilized as necessary to ensure successful vegetation establishment.

F-3.13 LAND STATUS/USE

Roads, power lines, and pipelines will be located adjacent to existing compatible linear facilities wherever possible.

F-3.14 RECREATION

1. Operators will post appropriate warning signs and require project vehicles to adhere to appropriate speed limits on project-required roads.
2. Operators will inform their employees, contractors, and subcontractors that long-term camping (greater than 14 days) on federal lands or at federal recreation sites is prohibited.
3. Operators will direct their employees, contractors, and subcontractors to abide by all state and federal laws and regulations regarding hunting and artifact collecting.

F-3.15 TRANSPORTATION

1. Detailed practices and procedures as specified in the TP for this project (ROD AppendixB) will be followed. Annual TPTSD updates (BLM 1999) will be developed and will identify the minimum road network required to support annually proposed project activities, as well as construction and maintenance responsibilities of the Operators. Annual TPTSD updates will also identify dust abatement, road construction, and surfacing requirements.
 2. Existing roads will be used to the maximum extent possible and upgraded as necessary.
 3. All Operator-constructed roads not required for routine operation and maintenance of producing wells or ancillary facilities will be reclaimed as directed by the BLM, Wyoming State Land Board, or private landowner. As necessary, these roads will be permanently blocked, recontoured, reclaimed, and revegetated by Operators, as will disturbed areas associated with permanently plugged and abandoned wells.
 4. Where required by the BLM, site-specific centerline surveys and/or detailed construction designs will be submitted to and approved by the BLM prior to road construction.
 5. Operators will comply with existing federal, state, and county requirements and restrictions to protect road networks and the traveling public.
 6. Special arrangements will be made with the WDOT to transport oversize loads to the CD/WIIPA.
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- Otherwise, load limits will be observed at all times to prevent damage to existing road surfaces.
7. All development activities along approved ROWs will be restricted to areas authorized in the approved ROW.
 8. Operators will be responsible for maintenance of roads in the project area and for closure of roads following production activities.
 9. Where proposed roads will follow existing roads, those portions of existing roads not included in the new ROW will be reclaimed and revegetated by the Operator.
 10. Available topsoil (up to 12 inches) will be stripped from all road corridors prior to commencement of construction activities and will be redistributed and reseeded on back slope areas of the borrow ditch after completion of road construction activities. Borrow ditches will be reseeded in the first appropriate season after initial disturbance.

F-3.16 VISUAL RESOURCES

1. Operators will utilize existing topography to screen roads, pipeline corridors, drill rigs, wells, and production facilities from view where possible.
2. Operators will paint all aboveground production facilities with appropriate colors (e.g., Carlsbad Canyon or Desert Brown) to blend with the adjacent terrain, except for structures that require safety coloration in accordance with Occupational Safety and Health Administration (OSHA) requirements.

F-3.17 HEALTH AND SAFETY/HAZARDOUS MATERIALS

1. Operators will utilize WDEQ-approved portable sanitation facilities at drill sites.
 2. Operators will place warning signs near potentially hazardous areas (e.g., well locations, ancillary facilities) and along roadways.
 3. Operators will place appropriate dumpsters at each construction site to collect and store garbage and refuse.
 4. Operators will ensure that all refuse and garbage is transported to a State of Wyoming-approved sanitary landfill for disposal.
 5. Each operator will institute a Hazard Communication Program for its employees and will require subcontractor programs in accordance with OSHA (29 C.F.R. 1910.1200).
 6. Operators will keep on file, at the field office, a Material Safety Data Sheet (MSDS) for every chemical or hazardous material that is brought on-site in accordance with 29C.F.R. 1910.1200.
 7. SPCC Plans will be written and implemented where applicable in accordance with 40 C.F.R. 112.
 8. Chemical and hazardous materials will be inventoried and reported in accordance with the regulations for implementing the SARA Title III (40 C.F.R. 335). If quantities exceeding 10,000 pounds or the threshold planning quantity (TPQ) are to be produced or stored, the appropriate Section 311 and 312 forms will be submitted at the required times to the State and County Emergency Management Coordinators and the local fire departments.
 9. Any hazardous wastes, as defined by the *Resource Conservation and Recovery Act of 1976*, (RCRA) as amended, will be transported and/or disposed of in accordance with all applicable federal, state, and local regulations.
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F-4.0 ADDITIONAL BLM MITIGATION AND/OR MONITORING REQUIREMENTS

The following mitigation and/or monitoring requirements were identified in EIS, Chapter 4.0, and have been added to help further reduce impacts to certain resources. The resource values listed below were identified in the EIS under the Proposed Action as likely to be significantly impacted. These additional mitigation/monitoring requirements are intended to protect and further decrease the impacts to the resource; however, they are not expected to decrease impacts to a level of no significant impact.

F-4.1 SOILS

Operators will be required to conduct regular monitoring of erosion control structures within the CD/WIIPA to ensure maintenance of the operating integrity of these structures. Monitoring procedures and schedules will be specified in APDs or ROW applications and will comply with specifications contained in ROD Appendix A. Appropriate remedial action will be taken by Operators to correct non-functioning structures.

F-4.2 WATER RESOURCES

Additional monitoring and erosion and runoff control measures will be applied on disturbed areas in the Antelope/Bitter Creek drainage to ensure no further degradation of stream channels.

F-4.3 NOISE AND ODOR

Noise mitigations (e.g., equipment housing) will be applied at well locations, as determined necessary on a case_by_case basis by the BLM. Construction, drilling, completion, testing, and production facility installation activities will be limited within 0.25 mi or other distance of occupied residences.

F-4.4 LAND USE

To provide additional environmental protection for area residents, the BLM will require that well locations and associated production equipment be situated 350 ft or greater distance from residences. (This is in conformance with rules and regulations of the WOGCC). Furthermore, the BLM will consult with community and county governments/organizations to obtain input and advice regarding the protection of public health and safety in and proximal to rural residential areas.

F-4.5 RATIONALE FOR EXCLUSION OF ADDITIONAL MITIGATIONS

Additional potential BLM environmental protection and mitigation and monitoring measures as identified in EIS Chapter 4.0 that are not included as requirements for this project were not adopted for one or more of the following reasons:

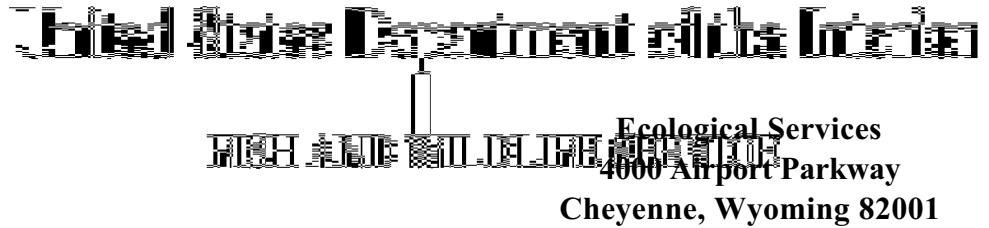
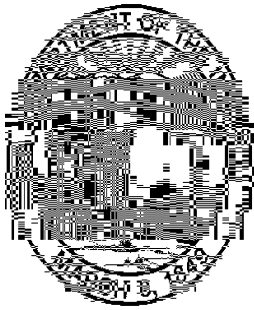
- the measure is not the responsibility of the BLM and therefore cannot be required (i.e., another agency is responsible for authorization);
 - the measure is not necessary for protection from undue and unnecessary environmental degradation;
 - analyses revealed that the measure was not necessary for adequate environmental protection (e.g., impacts without the measure were less than significant);
 - the measure is already included as a component of the Proposed Action; and/or
 - the measure would result in unreasonable restriction on leased lands.
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F-5.0 REFERENCES

- Avian Power Line Interaction Committee. 1994. Mitigating bird collisions with power lines: The state of the art in 1994. Edison Electric Institute, Washington, D.C. 78 pp. + append.
- _____. 1996. Suggested practices for raptor protection on power lines: The state of the art in 1996. Edison Electric Institute/Raptor Research Foundation. Washington, D.C.
- Bureau of Land Management. 1985. Manual 9113: Roads. Engineering, Rel. 9-247. U.S. Department of the Interior, Bureau of Land Management.
- _____. 1986. Oregon/Mormon Pioneer National Historic Trails management plan. U.S. Department of the Interior, Bureau of Land Management. BLM-WY-86-007-4333. 244 pp.
- _____. 1991. Wyoming supplement to the Bureau 9113 Manual. U.S. Department of the Interior, Bureau of Land Management, Wyoming State Office, Cheyenne, Wyoming. 16 pp.
- _____. 1992. Green River Resource Area management plan and draft environmental impact statement. U.S. Department of the Interior, Bureau of Land Management, Rock Springs District, Rock Springs, Wyoming, BLM-WY-ES-92-019-4410. 901 pp.
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APPENDIX G:

**U.S. FISH AND WILDLIFE SERVICE
BIOLOGICAL OPINION**



ES-61411 June 21, 2000
W.02 (BIO-OPIN.WPD)

Memorandum

To: Field Manager, Rawlins Field Office, Bureau of Land Management

From: Field Supervisor, Ecological Services, Cheyenne, Wyoming

Subject: Final Biological and Conference Opinions for the Proposed Continental Divide/Wamsutter II Natural Gas Project, Sweetwater and Carbon Counties, Wyoming

This document transmits the U.S. Fish and Wildlife Service's (Service) final biological and conference opinions based on our review of the proposed Continental Divide/Wamsutter II Natural Gas Project (project), in Sweetwater and Carbon counties, Wyoming, and its effects on federally listed and proposed species in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Your November 12, 1999, request for formal consultation was received on November 15, 1999.

These biological and conference opinions are based on information provided in the Bureau of Land Management's (BLM) draft (BLM 1999a) and final (BLM 1999b) environmental impact statements (EIS); attached biological assessment (BA) including a description of the project proposal; meetings of November 20, 1998, October 12, November 8, December 16, 1999 and March 7, 2000; memoranda of July 10, 1998, and February 23, 1999; letter of January 20, 2000 (Michael J. Brennan, Holland and Hart, Attorneys at Law); and numerous telephone conversations. A complete administrative record of this consultation is on file at the Service's Wyoming Field Office.

This office has been working with BLM, Rawlins Field Office staff, representatives of the major natural gas lease holders on the EIS analysis area (hereafter 'Operators'), and staff of TRC Mariah, the consultant preparing the EIS, since May 30, 1997, to minimize or avoid impacts to federally listed species. This work has included development of the Wildlife Protection Plan (Appendix D of the draft EIS), review of the draft EIS and several preliminary drafts of the BA.

In our memorandum of July 23, 1999, we recommended the BLM initiate formal conference for the proposed threatened mountain plover to avoid possible project delays in the future should the species be listed. In our memorandum of October 25, 1999, we reiterated this point and further recommended that, if the project could not be modified to explicitly avoid disturbance to prairie dog towns in which black-footed ferrets are discovered, then the Service would be unable to concur with a "not likely to adversely affect" determination for the black-footed ferret and BLM should initiate formal consultation. In response to this and the meeting of November 8, 1999, between Service and BLM staff, you requested initiation of formal conference on the mountain plover, and formal consultation on the black-footed ferret in your memorandum of November 12, 1999. In our memorandum of March 22, 2000, the Service requested an extension until April 21, to respond to BLM and applicant comments. In your memorandum of March 24, BLM approved this request.

BIOLOGICAL AND CONFERENCE OPINIONS

Description of Proposed Action

In the EIS for the project, the BLM described the proposed action as the continued issuance of permits on Federal lands necessary for the exploration and development of natural gas reserves in portions of Sweetwater and Carbon counties, Wyoming. Operators propose to construct, operate, and reclaim a maximum of 3,000 new well locations (2.6 acres per location) 1,500 miles of new or upgraded roads (3.3 acres per location), 1,500 miles of new pipelines (1.5 acres per location), 5 compressor stations (20 total acres, 4 acres per station), 1 gas processing facility (30 acres), 10 evaporation ponds (34 acres), 5 disposal wells (35 acres), and 50 water wells (25 total acres, 0.5 acre per well). Total maximum initial ground disturbance is estimated at 22,400 acres with disturbance of 15,900 acres continuing through the project life. This development will be divided roughly 50% on Federal and 50% on non-Federal surface ownership. Construction is expected to occur over 10-20 years with operation and reclamation continuing over a 30-50 year project life. During construction, approximately 150-300 wells would be drilled per year.

The proposed action includes implementation of a reclamation plan, travel management plan, and wildlife monitoring/protection plan (appendices A, B, and D of the EIS, respectively). One purpose of these plans is to minimize impacts to sensitive resources, including federally listed and proposed species, by reviewing the effects of ongoing actions and modifying future development accordingly. The reclamation plan is designed to provide guidance to achieve successful reclamation while permitting flexibility in site-specific reclamation activities. The transportation plan is intended to provide a means for public involvement in ongoing review and planning of the developing road system. It will help to identify and avoid or minimize conflicts between sensitive resources, including federally listed and candidate species, and the developing transportation system. The wildlife protection plan is intended to avoid or minimize project impacts to wildlife by monitoring population trends as the field develops, annually reviewing project activities and identified impacts, and modifying future development through an adaptive management process.

The wildlife protection plan describes measures identical to the biological assessment to avoid or minimize impacts to any black-footed ferrets or mountain plovers which may be found. For the black-footed ferret, this includes avoidance of prairie dog towns where practical. Project-specific ferret surveys would be conducted if prairie dog towns are to be disturbed. If ferrets are found, the Service would be contacted for guidance prior to ground-disturbing activities. For the mountain plover, protective measures include surveys for nesting mountain plovers prior to ground-disturbing activities during the breeding season. If a plover is found nesting or attending a flightless brood in the area, ground-disturbing activities would be delayed long enough to avoid possible take (37 days, or one week post-hatch for nests; or 7 days for broods).

The project analysis area lies in eastern Sweetwater County and southwestern Carbon County, Wyoming, in portions of Townships 15 through 23 North, Ranges 91 through 99 west. It extends over 1,061,200 acres, including 531,400 acres of Federal surface, 9,800 acres of State surface, and 520,000 acres of private surface interspersed in a "checkerboard" pattern, resulting from Federal land grants of the 19th Century. This highly interspersed surface ownership makes the analysis of the effects of any project-level Federal action difficult. There will be many actions on non-Federal surface that would not occur but for a Federal action. These actions must be considered inter-related or inter-dependent to the Federal action. New Federal rights-of-way (ROW) for access to non-Federal inholdings will commonly lead to inter-related and inter-dependent actions on non-Federal lands. While there is no specific analysis of the extent of the relationship between development on Federal and non-Federal surface in the EIS, it is reasonable to assume that the number of development actions entirely independent of a future Federal action will be very small.

The analysis area currently contains a moderate level of gas field development as well as an existing network of roads and trails to support ongoing land management activities. Other development includes the I-80 corridor, including the highway, rail lines, interstate pipelines and communications cables, and the communities of Creston, Wamsutter, Red Desert, and Tipton.

The analysis area contains generally flat topography with elevations ranging from 6,500 to 7,500 feet above sea level. The climate is typical of the Great Basin ecoregion, with long, cold winters, high winds, and limited rainfall. Vegetation communities of the analysis area are also typical of Great Basin shrub-steppe grasslands, dominated by Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), greasewood (*Sarcobatus vermiculatus*), mixed desert shrub species, or Gardner's saltbush (*Atriplex gardneri*). Riparian

habitat, dominated by willow (*Salix* spp.), basin big sagebrush (*A. t. tridentata*), and greasewood; unvegetated playas; wetlands; and short-or mixed- grass prairie are important wildlife habitats that cumulatively constitute less than 1% of the analysis area. Bare rock and soil comprises approximately 2.9% of the analysis area. White-tailed prairie dog (*Cynomys leucurus*) towns cover a significant portion of the analysis area. They may be present on as many as 324 sections, as represented in Map 3.11 of the draft EIS (Appendix 1), though resolution and currency of the data are inadequate for a clear understanding of prairie dog abundance at this time. The habitat provided by prairie dog towns is important for a number of federally listed, proposed, and State sensitive species.

Detailed descriptions of the proposed action and the environment of the analysis area are contained in the draft and final EIS's (BLM 1999a and BLM 1999b) and included here by reference.

Status of species

LISTED SPECIES

Black-footed Ferret

Unless otherwise noted, information presented here is drawn from the Black-footed Ferret Recovery Plan (U.S. Fish and Wildlife Service 1988).

Species Description

The black-footed ferret is a small weasel-like carnivore within the Family Mustelidae (weasels, skunks, badgers, and otters) and is the only ferret native to North America. It is closely related to two Old World species, the Siberian and European polecats. Relatively small and long-bodied with short limbs, its overall pelage coloration is yellow-buff or tan, darker along the dorsum with a distinctive combination of black feet, tail tip, and forehead or broad facial mask. The body length averages 15-18 inches with a tail length of about 5-6 inches. The body weight is approximately 2_ pounds.

The species was thought to be extinct until a single surviving population was discovered near Meeteetse, Wyoming in 1981. Eighteen individuals from this single population (which once consisted of about 130 animals) provided the source of all captive-bred and reintroduced ferret populations. Outbreaks of sylvatic plague and canine distemper at Meeteetse in 1985, led to severe population declines and concern for the continued existence of the species. In response, the surviving ferrets were removed from the wild for captive breeding, a process that was complete by 1987.

The black-footed ferret was federally listed as endangered on March 11, 1967 (32 FR 4001). The species has been re-introduced to portions its former range in Montana, South Dakota, Wyoming, Utah, and Arizona. Re-introduced populations have been designated as "experimental non- essential" in accordance with section 10(j) of the Act. Critical Habitat was not designated.

A recovery plan was approved on June 14, 1978, and updated on August 8, 1988. The plan's criteria for downlisting to threatened call for: 1) increasing the captive population size to 200 breeding adults by 1991, 2) establishing a pre-breeding population of 1,500 free-ranging adult ferrets consisting of 10 or more populations (with no fewer than 30 breeding adults in each population) by the year 2010, and 3) promoting the widest distribution of ferret re-introductions. Downlisting to threatened is also contingent upon a net increase (5-year minimum trend) of ferret establishment in approximately one tenth of 1% of their former range (approximately 185-250,000 acres).

Life History

Only two wild populations of black-footed ferrets have been studied in detail: one in Mellette County, South Dakota from 1964 through 1975; and one in Park County, Wyoming from 1981 through 1987. Additional information has begun to come from re-introduced populations. Therefore, many analyses and conclusions are based on limited observations, study of captive individuals, or inference from life history of congeners.

The black-footed ferret is a secretive, mostly nocturnal, solitary predator of prairie dogs (*Cynomys* spp. - i.e., black-tailed, *C. ludovicianus*; Gunnison's, *C. gunnisoni*; and white-tailed, *C. leucurus*), which constitute the

main prey as well as providing the burrow systems required by the ferret for breeding and shelter. Though prairie dogs make up over 90% of its diet, the black-footed ferret also feeds on rabbits, mice, voles, ground squirrels, pocket gophers, birds, and insects.

Ferrets normally occupy prairie dog burrows but may dig their own. The size and aggregation of these towns appear to be the most important factors comprising suitable habitat. Ferret densities are positively correlated with prairie dog densities. The smallest town known to support one adult ferret in one year is about 31 acres. Normally, ferrets are not found in prairie dog towns less than 100 acres. Current ferret re-introduction efforts are limited to complexes not less than 10,000 acres in area to ensure maintenance of self-sustaining populations (Michael Lockhart, pers. comm., March 28, 2000).

Breeding takes place in March or April, and females produce litters of 2-5 kits after a 41-45 day gestation. Although the male may be nearby, the female cares for the kits alone. The young are born helpless and remain in the nest approximately 40 days from birth. By September they begin to disperse, late summer and fall constituting a period of increased observability. This period of dispersal also presents the greatest danger to young-of-year ferrets as many mortalities have been observed in the period of August through October.

Predators include the great horned owl (*Bubo virginianus*), golden eagle (*Aquila crysaetos*), ferruginous hawk (*Buteo regalis*), badger (*Taxidea taxus*), and coyote (*Canis latrans*). Potential but undocumented predators may include the bobcat (*Lynx rufus*), fox (*Vulpes* spp.), and prairie falcon (*Falco mexicanus*).

In Wyoming, disease has had a great influence on populations. The black-footed ferret has no natural resistance to canine distemper, and the disease may be up to 100% fatal to infected individuals. In 1985, it was estimated that the Meeteetse population was reduced 50% per month as the distemper outbreak progressed. *Yersina pestis*, the causative agent of sylvatic plague, may also have a significant impact on population stability, both directly through significant black-footed ferret mortality and reduction in prey abundance. Prairie dogs are highly susceptible to this disease, quickly reducing prairie dog numbers in an affected town by 20-80%. With prey populations so greatly reduced, black-footed ferrets have difficulty meeting their nutritional requirements and ferret populations decline or disappear.

Population Dynamics

Black-footed ferrets annually produce one litter of 2-5 kits (mean = 3.3). Females may breed in their second year. Highest population numbers at Meeteetse were observed during the summer, when approximately 70% of the population consisted of juvenile animals.

While the sex ratio at birth is not different from 1:1, at Meeteetse adult females outnumbered males by 2:1. This is probably due to the larger home range of the adult male and longer dispersal movements of juvenile males, which exposes them to higher predation than females. Mortality of males in the first year was estimated to be between 56 and 81%. Life expectancy for black-footed ferrets in the wild is about 5 years.

Because of the short life span of the black-footed ferret, any yet-to-be found remaining wild populations must be sustained by successful reproduction and high first-year survival, parameters largely dependent upon an adequate density and distribution of their main prey, the prairie dog. Because of the ferret's almost complete dependence on the prairie dog, large fluctuations in prairie dog abundance due to outbreaks of sylvatic plague or poisoning may cause exaggerated fluctuations in black-footed ferret abundance, in some cases leading to local extirpation.

Status and Distribution

Historically, black-footed ferrets ranged widely within the Great Plains including areas within Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, Wyoming, and the Canadian Provinces of Alberta and Saskatchewan. The historical range is nearly identical to that of the black-tailed, white-tailed and Gunnison's prairie dogs. Widespread control or eradication of the prairie dog in the 20th Century, conversion of native prairie to tilled agriculture, and the introduction of sylvatic plague have resulted in the endangerment of the black-footed ferret. Ferret declines have been shown to correlate to decreases in area of prairie dog towns in a linear fashion. Fragmentation of remaining towns presents additional problems. Increasing isolation of towns inhibits the movement of ferrets within populations

and mortality associated with dispersal movements probably increases. This further decreases the likelihood of recolonization of the remaining small amount of unoccupied but otherwise suitable habitat.

In Wyoming, black-footed ferrets formerly occurred in all non-mountainous areas of the State (Clark and Stromberg 1987). No wild ferrets have been found since the loss of the Meeteetse population in 1987. Currently, there are no known naturally occurring ferret populations within the historical range of the species. Because there are remote areas with large acreages of un-surveyed prairie dog towns and because the ferret's fossorial and nocturnal habits make it difficult to detect, wild populations of ferrets could remain in un-surveyed prairie dog towns. Several re-introduced populations have been established with varying success. Re-introduction has occurred in the Shirley Basin/Medicine Bow Management area (east-central Wyoming), Conata Basin/Badlands Reintroduction Area (southwestern South Dakota), North-Central Montana Reintroduction Area (north-central Montana), Aubrey Valley (northwestern Arizona), and the Coyote Basin in north-eastern Utah.

Analysis of the Species Likely to Be Affected

According the Service's Black-footed ferret survey guidelines (U.S. Fish and Wildlife Service 1989, hereafter, 'Ferret Guidelines'), "Any actions that kill prairie dogs or alter their habitat could prove detrimental to ferrets occupying the affected prairie dog town(s)." The current definition of black-footed ferret habitat in the Ferret Guidelines states that towns or complexes of white-tailed prairie dogs must exceed 200 acres in extent to meet the energetic demands of a black-footed ferret. According the Ferret Guidelines, a town or colony is defined as a group of burrows whose density meets or exceeds 8 burrows per acre and a complex is defined as two or more towns each within 4.34 miles of each other.

These criteria are based on the minimum energetic requirements of a reproducing female ferret (Biggins et al. 1993). Due to their 3-5 year life span, the long-term persistence of black-footed ferrets is dependent on reproduction and recruitment adequate to maintain a population. The likelihood of finding a lone ferret not associated with a population is extremely remote. New information from the study of re-introduced ferrets suggests that a ferret population may need considerably higher quality habitat to persist for more than a few generations. Ferrets were found on white-tailed prairie dog colonies exceeding 27 active burrows per acre in Shirley Basin, rather than on adjacent lower-density habitat (R. Luce, pers. comm., March 28, 2000). Also, the most consistently used colonies at Meeteetse were located within 0.9 mile of one another (D. Biggins, pers. comm., March 28, 2000). Finally, population monitoring at re-introduction sites suggests that prairie dog complexes as large as 10,000 acres may be necessary to maintain a ferret population, though evidence to support a specific minimum size criteria is currently lacking (M. Lockhart, pers. comm. March 28, 2000).

Because the Ferret Guidelines focus on the needs of individual ferrets rather than populations, it is apparent that use of the criteria in the Ferret Guidelines sometimes requires surveys in areas that are unlikely to support a population of black-footed ferrets over the long term. The Ferret Guidelines are designed for application on often small projects, where requirements to quantify ferret habitat over an area large enough to maintain a population would be excessively onerous. Therefore, for projects affecting small areas, they minimize the risk of taking ferrets without excessively burdening project proponents. Because the Continental Divide/Wamsutter II analysis area is large enough to contain one or more entire prairie dog complexes, habitat criteria and survey requirements differing from the Ferret Guidelines may be warranted if coordinated with efforts to identify complexes having a reasonable chance to maintain a viable or even residual population.

Therefore, in this analysis suitable habitat for black-footed ferrets will be defined differently than in the Ferret Guidelines. For the purposes of this document, suitable habitat will consist of colonies having a mean active burrow density of 27 burrows per acre, and a minimum area of 1,000 acres or be part of a complex with a minimum area of 1,000 acres. A complex is defined as a group of colonies individually having mean active burrow densities of 27 burrows per acre and occurring within 0.9 mile of one another, as delineated by Biggins et al. (1993). This definition updates and supercedes the criteria set in the Ferret Guidelines for this project. Hereafter, the term 'suitable habitat' (for black-footed ferrets) will refer to this definition. The Service expects that the black-footed ferret may be adversely affected if project activities will disturb portions of colonies or complexes meeting these criteria for suitable habitat.

The proposed action describes measures to be taken if a prairie dog town or complex meeting the size and density criteria in the Ferret Guidelines will be disturbed, but does not preclude such disturbance (BLM 1999a, Appendix E). Because disturbance to a town occupied by a black-footed ferret may cause take through direct mortality, harm or harassment, the Service could not concur with the BLM's finding that "the proposed project

is unlikely to adversely affect” the black-footed ferret (BLM 1999b). The Service disagrees with the conclusion that the species is unlikely to occur there because previous observations of black-footed ferrets exist from the analysis area. No data are presented to show that suitable habitat does not occur in the analysis area, and little organized black-footed ferret survey effort has occurred in the analysis area to date. Therefore, until the analysis area has been surveyed to locate suitable habitat and unless black-footed ferret surveys in all suitable habitat within the analysis area fail to find evidence of extant ferrets, the Service believes that the proposed action, as described, is likely to adversely affect the black-footed ferret.

PROPOSED SPECIES

Mountain Plover

Unless otherwise noted, the information provided here was drawn from proposed rule to list the mountain plover as threatened under the Act (64 FR 7587-7601).

Species Description

The mountain plover is a small bird, about the size of a killdeer (*Charadrius vociferus*) in the plover family (Family *Charadriidae*). The type specimen was collected in 1837 by J. K. Townsend on the Sweetwater River of Wyoming. It is light brown above with paler underparts, lacking the contrasting dark breast bands typical of many other plover species. Breeding plumage differs only by the addition of a dark line between the bill and eyes contrasting with a pale forehead. The bill is black and the legs are gray. The sexes are alike.

The mountain plover was designated a category 2 candidate species on December 30, 1982 (47 FR 58458), meaning that the species may be declining but more information was needed. The Service elevated its status to category 1 candidate in the 1994 Animal Candidate Notice of Review (59 FR 58982). In 1996, the Service did away with candidate categories 2 and 3, redefining candidate species to include only former category 1 candidate species (61 FR 64481). The mountain plover was retained as a candidate species in the 1997 status review (62 FR 49298). The species was petitioned for listing as threatened on July 7, 1997. Due to its candidate status, no 90-day finding was required in response to this petition. On February 16, 1999, the Service gave notice of a proposal to list the mountain plover as a threatened species pursuant to the Act (64 FR 7587). A final listing decision on this species is pending.

Life History

The mountain plover is a migratory species of the shortgrass prairie and shrub-steppe eco-regions of the arid West. The universal characteristics of mountain plover habitat on both the breeding and wintering grounds are short vegetation, bare ground, and flat topography. They are found associated with plains, alkali flats, agricultural lands, cultivated lands, sod farms, prairie dog towns, and low shrubs at both breeding and wintering locales. Unlike other plovers, they are rarely associated with water.

Nesting has been reported from Colorado, Montana, Wyoming, New Mexico, Arizona, Nebraska, Utah, Kansas, Oklahoma, Texas, and Canada, and is suspected in Mexico. Mountain plovers occupy breeding habitat from late March through July. Flocks may form as early as mid-June prior to migration to wintering habitats in August through October. Wintering areas are concentrated in the Central and Imperial valleys of California, Texas and Mexico. There are no wintering areas in Wyoming.

The nest of the mountain plover is a simple scrape on the ground, which may be lined with debris. Nests are usually placed in areas where vegetation is less than 4 inches in height, the amount of bare ground in the area exceeds 30%, and near a conspicuous object such as a manure pile or rocky area. In shortgrass prairie habitat, vegetation associated with nest sites includes blue grama (*Bouteloua gracilis*), buffalo grass (*Buchloe dactyloides*) and prickly pear cactus (*Opuntia* spp.). In shrub-steppe grasslands, vegetation around nests includes low-growing shrubs such as black sage (*Artemisia nova*) and Gardner saltbush (*Atriplex gardneri*) (Day 1994, Knopf 1996). Topography is typically flat or gently rolling. Hereafter in this document, “suitable mountain plover habitat” will refer to areas containing these characteristics: low relief, vegetation generally less than 4 inches in height, and bare ground present and at least locally exceeding 30% coverage.

The breeding season begins soon after birds arrive in late March or early April. Breeding season displays involve different calls and flight displays, including “falling leaf” and pursuit flights to advertise territory occupancy and define boundaries between territories. Territories in Colorado were about 40 acres, and adjacent territories may overlap significantly along boundaries. Breeding plovers show close site fidelity, often returning to the same territory in subsequent years. Territories tend to be aggregated with several breeding pairs occurring within a few square miles surrounded by empty but apparently suitable habitat (Knopf 1996).

Nests may be initiated 1-2 weeks after arrival on the breeding grounds and the clutch of 3 eggs may take 3-12 days to complete. Incubation lasts approximately 29 days. In Colorado, egg-laying began April 15, continuing through mid-June, with one late nest observed June 23. Adults were found to incubate or attend nests with increasing frequency and duration as the incubation period continued. Nest attendance in Wyoming increased from approximately 50% of daylight hours early in incubation to approximately 100% within days of hatching (Laun 1957). Eggs appear highly resistant to chilling but susceptible to overheating in the sun due to their dark coloration (Knopf 1996).

Chicks leave the nest soon after the last egg hatches. Chicks are usually attended by one adult, brooded about one third of the time for the first day. Daily movements of the broods may be extensive, with broods ranging over as much as 200 acres between hatch and fledging. Chicks fledge approximately 33 days post-hatch (Knopf 1996).

Known predators of adult mountain plovers are few. Kit fox (*Vulpes macrotis*) and prairie falcon (*Falco mexicanus*) are the only documented predators of adults. However, their ground nests are vulnerable to mammalian predators including the thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), swift fox, badger, and coyote, and possibly corvids (crows, ravens and magpies). Ground squirrels, coyotes, Swainson's hawks (*Buteo swainsonii*), prairie falcons, and loggerhead shrikes (*Lanius ludovicianus*) have been observed taking flightless young (Knopf 1996).

Population Dynamics

Species in the shorebird family are generally long-lived, with low annual reproductive rates and small clutch sizes. Available information on the mountain plover conforms to this pattern. Annual survival estimates for this species are unavailable, though over-winter survival is high, estimated at 0.9474 from a sample of 44 birds (Knopf 1996). Few data exist on the life span of the mountain plover, though one banded bird was recovered after 6 years.

Mountain plovers probably start breeding in their second year of life. Normal clutch size is 3, very rarely 4. Two-egg clutches probably result from predation of individual eggs. Birds are largely monogamous, though the pair bond is only maintained for a short period during breeding. There is some evidence that at least some females lay two clutches, one brooded by the male and the other by the female, a reproductive strategy not uncommon among the shorebirds (Knopf 1996).

Nest success has been estimated to vary from 26-65% between years and may be influenced by rainfall. Mountain plovers in Weld County, Colorado fledged an estimated 0.26 and 1.4 young per nest in different studies between 1969 and 1974, though the higher estimate is believed to be biased by the exclusion of nests which totally failed (Knopf 1996).

Status and Distribution

Historically, the mountain plover was considered numerous on breeding grounds in western and central Kansas and Oklahoma, western Nebraska and South Dakota, and eastern Colorado, Montana, and Wyoming. The eastern extent of the range has been greatly reduced, possibly due to conversion of native prairie to cultivated agriculture as well as control of burrowing rodents. Mountain plovers are no longer known to breed in Canada or South Dakota.

Approximately 1,500 birds are estimated to occur in Wyoming. Birds have been observed during the breeding season over much of the shortgrass prairie of the eastern parts of the State, with high densities reported in the Laramie Plains of northern Albany County and eastern Carbon County (Laun 1957, WEST, Inc. 1998), Converse County (Parrish 1989), Laramie County (Graul 1975), and Park County (BLM 1988).

Available data indicate that population numbers of mountain plovers have declined range-wide by more than 50 percent since 1966 to fewer than 10,000 birds. Identified or suspected reasons for decline include conversion of shortgrass and shrub steppe habitats, changes in range management to emphasize uniform grass cover, declines in native ungulates and burrowing animals, and possibly population sinks created by certain agricultural practices. A population 'sink' (Pulliam 1988) is an area within the breeding range of a species or population where reproduction is not adequate to balance mortality, but population levels are maintained by immigration of breeders produced in a nearby 'source' area.

Analysis of the Species Likely to Be Affected

The mountain plover is known to breed in the analysis area. The proposal to list the species (64 FR 7587) describes the possible adverse effects of oil and gas development within the breeding range of the species, and identifies the possibility of take of mountain plovers from a number of activities included in the proposed action. Therefore, the Service concurs with BLM's determination that the proposed action is likely to adversely affect the species.

Environmental Baseline

LISTED SPECIES

Black-footed Ferret

Status of the Species within the Action Area

Wyoming is relatively unique in the coterminous United States in retaining vegetation and wildlife communities largely unchanged from pre-settlement times (Knight 1994). Extensive areas of sage-brush steppe still occur across the southern portion of the State, home to large white-tailed prairie dog towns and complexes. Some of these are large enough, according to the best currently available information, to maintain one or more extant populations of black-footed ferrets. The area roughly bounded by Rawlins, Wyoming west to Kemmerer, Wyoming and south to the Wyoming border holds the highest potential within the historical range of the species for such a discovery (R. Luce, pers. comm., December 1999).

The analysis area is within this region of abundant white-tailed prairie dogs and relatively little human activity. Map 3.11 in the draft EIS (Appendix 1, this document) identifies 1-square-mile areas in the analysis area with current and historical records of prairie dog towns, illustrating the possibility of potential black-footed ferret habitat occurring in the analysis area. However, information used to develop this map is neither current enough or of a large enough scale to allow an accurate assessment of suitable black-footed ferret habitat.

The BA provides the following records of ferret sightings in the analysis area (certainty unknown): two juvenile ferrets seen 5 miles south of I-80 in the central portion of the analysis area, July 1972; one ferret observed in the northern portion of the analysis area in 1975; and a partially buried, weathered ferret skull found on the northeastern edge of the analysis area, August 1981 (T22,R93, S33,NWNW). In addition, 14 sightings of varying certainty have been recorded on or within 10 km of the analysis area between 1969 and 1989: T22, R97, S26 on August 14, 1975; T23, R101,S18 on June 28, 1976, and T19, R100,S5 on November 12, 1981 (WGFD WOS 1998); T18, R93,S21, in 1969; 10 miles west of Rawlins near UPRR tracks in 1971; T17, R95,S30 in September 1985; T17, R99,S2 in September 1974; T18, R93,S14 in August 1989; T18, R95 in July 1985; T19, R94 in the summer of 1977 or 78; T19, R96,S17 in September 1985; T19, R97,S7 in July 1983; T23, R98 in May 1983; and T24, R93,S15 in 1984 (Kinter and Martin 1992).

While some black-footed ferret surveys have been conducted in this area (Cerovski et al. 1992), there has been little coordinated, large-scale mapping of prairie dog complexes and no complexes have been cleared of ferrets in accordance with the Ferret Guidelines. Therefore, according to the best available information, the presence of an undiscovered ferret population in this area cannot be ruled out.

Factors Affecting the Species within the Action Area

The EIS describes the existing condition of oil and gas development within the action area. Current development includes approximately 720 authorized, active, or un-reclaimed well locations, 1,800 miles of oil and gas field roads, 280 miles of un-reclaimed pipelines, several gravel pits, pumping stations, and staging areas, totaling approximately 18,400 acres on Federal, State, and private surface. No estimate is available of the amount of prairie dog towns disturbed by the existing developments. However, approximately half of the analysis area is on Federal surface, and BLM has a long-standing policy to avoid disturbance in prairie dog towns where possible. Therefore, it is possible that at least half of this development has not disturbed prairie dog towns to a significant degree.

Development unrelated to oil and gas development includes county, State and Federal highways (2,300 acres), railroads (1,100 acres), and residential and urban development, cultivated areas, utility lines and other non-project development (1,800 acres), totaling 5,200 acres. It is unclear how much of this development has disturbed prairie dog towns.

PROPOSED SPECIES

Mountain Plover

Status of the Species within the Action Area

Areas meeting our current understanding of suitable breeding habitat for the mountain plover, consisting of areas of short vegetation, bare soil, and level or gently rolling topography, are widely distributed in the analysis area. Virtually none of this area has received coordinated surveys for the species, however. Research from Colorado (Graul 1975) and Utah (Ellison 1998) suggests that the occurrence of breeding plovers may be distributed more in relation to other breeding plovers (aggregation of nest sites), rather than apparently suitable habitat. This suggests that either research has not yet adequately described suitable habitat, or the species is not currently limited by the availability of suitable habitat but is tied to historically used breeding areas. Combined with known high site fidelity, this suggests that these historically used nest site aggregations may be an important unit of conservation.

There are 10 observations of mountain plovers within the analysis area from the breeding season and an additional 23 observations within 20 miles of the analysis area (Appendix 2). There has been no organized survey effort for the species other than Breeding Bird Survey (BBS), a general survey for all breeding species. The Wamsutter BBS route, the only one entirely within the analysis area, has not recorded the species.

Factors Affecting the Species within the Action Area

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Development unrelated to oil and gas development includes county, State and Federal highways (2,300 acres), railroads (1,100 acres), and residential and urban development, cultivated areas, utility lines and other non-project development (1,800 acres), totaling 5,200 acres. Again, it is unclear if or to what extent this development has disturbed breeding mountain plovers or historically used breeding concentration areas.

Effects of the Action

LISTED SPECIES

Black-footed Ferret

Activities associated with exploration and development of gas reserves may not be entirely incompatible with the continued existence of a black-footed ferret population. At Meeteetse, Wyoming, a producing field coexisted with the ferret population there since 1948 with no evidence that production activities caused any

losses of ferrets (Forrest et al. 1985). However, no information is available to determine if the original development of the field adversely affected the ferrets at Meeteetse. There are many aspects of field development, operation, reclamation and abandonment that, if not properly regulated, could lead to unnecessary harm or even lethal take of individuals that may be present, in violation of section 9 of the Act. The Service believes that because of the dependence of the ferret on the prairie dog, any development which disturbs a prairie dog town constituting suitable ferret habitat may adversely affect the black-footed ferret unless surveys are completed and find no ferrets within the town prior to ground-disturbing activities.

A significant mitigating feature of the project is the dispersed nature of proposed disturbance. Given that average project-related disturbance is estimated at 3.6 acres per well location (including necessary roads and pipelines but not ancillary facilities; draft EIS, Table 2.1) and the proposed level of development is 4 well locations per section, impacts will be dispersed (no more than 2.25% of any section disturbed). Because of this, destruction or degradation of an individual ferret's habitat through development would rarely be intensive enough to cause death, though may be intense enough to cause injury.

Exploration: Geophysical exploration involving shot-hole or surface shot techniques may destroy vegetation and disturb prairie dogs and ferrets. In using the shot-hole method, some vegetation is crushed in lanes 10-12 feet wide and hundreds of yards long over a grid pattern. Drilling shot-holes may destroy vegetation and prairie dog burrows. Detonation of explosives within the holes causes vibrations and excessive noise that may destroy burrows or disturb ferrets sufficiently that they leave the area. Surface shot techniques are similar except that explosives are detonated on the surface, exacerbating the impacts of vibration and noise on burrow systems and ferrets.

Development: When conducted in suitable ferret habitat, any ground disturbing activities may result in mortality to black-footed ferrets due to soil compaction or excavation. In addition, activities described below may produce direct and indirect impacts to ferrets. Increased traffic could result in direct take of ferrets through vehicle collisions and noise and activity may displace ferrets. Increased human activities may promote the transmission of distemper or sylvatic plague carried by employees' pets.

Access to the well pad will require construction of roads using standard techniques. In active prairie dog towns constituting suitable ferret habitat, direct take of black-footed ferrets may result due to soil compaction and earth-moving activities if occupied by ferrets. Loss of suitable ferret habitat may result from the destruction of prairie dog burrows within the road right-of-way (ROW), an approximately 42-52 feet wide disturbance area. Increased traffic is expected. Indirect effects to ferrets could result from alteration of surface drainage and flooding burrows. Finally, roads will allow increased recreational activity including prairie dog shooting, which may reduce prey availability, and increased likelihood of introducing diseases such as sylvatic plague and distemper. Pipeline construction differs from road construction in having very short-term impacts to habitat, and not resulting in increased traffic. However, direct take due to soil compaction and earth-moving activities in occupied suitable ferret habitat is still a possibility.

Well pad construction requires creation of a level pad and excavation of a reserve pit to hold drilling fluids, using earth-moving equipment. The process takes about 2 days per pad. In occupied suitable ferret habitat this may result direct take as well as initial loss of approximately 1.8 acres of ferret habitat per pad, prior to partial reclamation to approximately 0.8 acres of disturbance. Indirect impacts would involve increased traffic (up to 20 trips per day at each pad), noise and human activity during the construction period. Alteration of surface drainage may flood burrows.

Drilling operations require the installation and operation of a drilling rig on-site, requiring 3 crews of 7 working around the clock for approximately 20 days. This level of activity is likely to displace ferrets some distance from the pad, making additional prairie dog habitat unsuitable for some distance around the drill rig. Displacing females during the early breeding season could cause reproductive failure due to abandonment of kits, or increased exposure to predators while moving the litter. Traffic and its associated risks will increase during drilling. Completion and testing operations, and installation of production facilities involve no new surface disturbance, but would require human activity and traffic for an additional 15 days.

Construction of ancillary facilities, including compressor stations, processing plants, evaporation ponds, and wells, will involve varying amounts of surface disturbance, which, if carried out in prairie dog towns, may result in mortality or disturbance to black-footed ferrets. Permanent structures that provide perch or nest sites

for avian predators or den sites for terrestrial predators (e.g., buildings, tanks, and power poles) may indirectly increase the incidence of predation on black-footed ferrets.

Operation: Though traffic will greatly decrease after initial construction, operating wells will still require periodic maintenance and visits to remove produced condensate, maintaining low levels of impact associated with traffic and human activity. Elevated structures on the well pad, especially condensate tanks, will provide new nest and perch sites for birds of prey, including ferruginous hawks, golden eagles, and great horned owls. Presence of these known or suspected predators of black-footed ferrets will increase the likelihood of ferret mortality. Work-over of producing wells will occasionally produce levels of traffic, noise, and human activities that could lead to direct take of ferrets or displacement from the vicinity of the well pad. Use of the new road system by recreationists will increase traffic and human activity.

Abandonment and Reclamation: Reclamation of drill pads, roads, and pipelines will involve a small increase in traffic, noise, and human activity from operation-level activities, possibly leading to direct take as well as disturbance and displacement of ferrets in the area. Final reclamation of well pads will increase activity and disturbance to ferrets around the pad. Placement of a marker to identify plugged wells may provide a permanent hunting perch for avian predators, increasing mortality risk to black-footed ferrets.

Inter-related and Inter-dependent Effects: The highly interspersed checkerboard ownership on the analysis area creates many challenges for protection of black-footed ferrets and their habitat. There will be many actions on non-Federal surface that would not occur but for a Federal action (i.e., they are inter-related or inter-dependent to the Federal action). ROW's for access to non-Federal inholdings will be a common Federal action leading to inter-related and inter-dependent actions on non-Federal lands. Where a Federal action or its inter-related or inter-dependent actions will lead to any of the effects described above on the non-Federal lands, the BLM will be responsible for additional assessment of such impacts to black-footed ferrets once site-specific information becomes available. The BLM has acknowledged this responsibility in their informational memorandum of February 23, 1999 (Appendix 3).

PROPOSED SPECIES

Mountain Plover

Disturbance leading to loss of reproductive potential may occur in several ways. Different effects to nesting plovers are likely depending on the onset, duration, and frequency of human disturbance. Aside from direct take of nests, chicks, and adults through vehicle collision, human disturbance may cause direct loss of eggs or chicks if attending mountain plover adults are displaced long enough to expose the eggs or chicks to excessive heating, chilling, or risk of predation.

If disturbance occurs more frequently than weekly through the breeding season, nesting birds may be displaced and may initiate nests a secure distance from the disturbed area. While this may reduce the amount of nest failure from disturbance, it may nonetheless result in reduced plover reproduction if plovers are displaced to less suitable nesting areas. Indeed, significant amounts of previously occupied habitat may be made unavailable in this way. Preliminary data from the Foote Creek Rim suggest that breeding plovers may be displaced from areas of high human activity (WEST, Inc. 1999). If nesting birds are displaced to nest in less suitable habitat where nesting success is lower, this would result in lost breeding potential.

If disturbance begins after the onset of nesting or occurs at intervals greater than 2 weeks apart, birds may have already initiated nesting within the disturbance area. Then, human activity causing displacement of incubating adults from active nests may result in addling eggs due to extremes of temperature or destruction of eggs by predators. During incubation, the mountain plover is fairly insensitive to human disturbance from vehicles as close as 3 meters but may be displaced from the nest by a human on foot at a much greater distance. Eggs or newly hatched chicks may also be crushed by vehicle traffic at any speed.

Human disturbance is especially problematic where human activity has created disturbed areas attractive to nesting mountain plovers. In Utah, mountain plovers have been found to nest as close as 6 m from open roads or operating oil well pads (Ellison et al. 1999), presumably attracted by the abundance of bare soil. Creation of apparently suitable habitat with high levels of human disturbance may actually attract breeding plovers to an 'ecological trap' (Pulliam 1988) where nests are initiated but fail due to disturbance and reproductive effort is wasted.

Mountain plovers are known to lead broods onto roads to forage at night (Laun 1957, Ellison et al. 1999). Direct loss of chicks or even adults to vehicle collisions may increase where increasing traffic volumes or travel speeds correspond with concentrations of nesting and brood-rearing activity.

In addition to activities that may lead to direct mortality of adults or young, and reduce production, several factors may lead to indirect mortality. The eggs and young, and to a lesser extent adults, are susceptible to a number of avian and mammalian predators. These include corvids (ravens, magpies, crows), birds of prey (hawks and owls), coyotes, badgers, weasels, and foxes. These predators may benefit from human activities in a number of ways. Power poles, fence posts, condensate tanks, and other elevated structures may provide new hunting perches and nest sites for avian predators, increasing their hunting effectiveness and range. Buildings, trailers, and other permanent structures may provide safe den sites for mammalian predators. Research on the more well-studied sage grouse (*Centrocercus urophasianus*) has demonstrated that birds avoid elevated perch sites, including powerlines and fence posts by as much as $\frac{1}{2}$ mile (Braun 1998). Mountain plover adults, chicks, and eggs live in the same environment and suffer the same predators, therefore these structures may adversely affect their habitat and behavior similarly.

Finally, an increase in road-killed animals due to more roads, heavier traffic, and higher travel speeds may provide a new food supply for both avian and mammalian predators, most of which are also scavengers. This new food source may increase predator population size and may also extend their range into previously uninhabited areas, leading to higher rates of predation on mountain plover eggs, chicks, and even adults. Such an ecological relationship has been demonstrated in the Mojave Desert of California. Increases in roads and traffic have extended the range of avian predators (common raven and red-tailed hawk) exposing young desert tortoises (*Gopherus agassizii*) to much higher rates of predation than before development (Knight et al. 1993, Knight and Kawashima 1993).

Mountain plovers show high site fidelity to breeding territories between years and the persistence of breeding concentrations may be more important than mere availability of apparently suitable habitat for the persistence of the mountain plover. The necessity of social facilitation for effective breeding has been demonstrated in a number of avian species. Habitat degradation occurring outside of the breeding season may cause take in the form of harm by causing abandonment of historically used breeding areas, though no direct take of plovers, eggs, or chicks occurs. Harm would result if removal or degradation of nesting habitat on historically used sites resulted in loss of breeding capability upon the birds' return, and/or resulted in loss of the pair for lack of available feeding or nesting habitat. Development activities, including construction of roads, well pads, and ancillary facilities that degrade habitat in historically used breeding areas could have this effect, whether or not they occur during the breeding season. Human activity associated with project development and operation in historically used breeding areas may harass nesting birds enough to cause them to abandon the breeding area, particularly if disturbance extends over more than one breeding season. Again, this could constitute take.

The key issue is whether or not birds displaced by project activities will move to new areas and successfully breed. Currently, information is inadequate to answer this question. While unoccupied areas meeting our understanding of suitable habitat exist, this could mean either that science has not accurately described suitable plover breeding habitat and these areas are not actually suitable, or that they are suitable and the mountain plover is currently not limited by availability of breeding habitat. Until the question is resolved the prudent management approach must be to identify and protect all breeding concentrations of the species.

Specific phases of gas development and the specific activities that may cause take are outlined below.

Exploration: Seismic survey work during the breeding season has the potential to cause direct take of adults, eggs, or chicks through vehicle collision or crushing. Increased human activity in the area may cause take of chicks or eggs through displacement of attendant adults.

Development: Given BLM's existing commitment to implement the Service's Mountain Plover Survey Guidelines (1999; Appendix 4, hereafter 'Plover Guidelines') and re-schedule work to avoid the breeding season if any mountain plover nests or broods are found, the likelihood of ground-disturbing activities, including construction of roads, well pads, pipelines, ancillary facilities, causing direct lethal take of plovers is discountable. However, increased traffic to and from construction sites may cause direct take through collisions with vehicles, and indirectly cause take by increasing predator numbers (by providing road-killed animals), thereby possibly increasing predation on adults, eggs, or chicks.

Drilling operations require the installation and operation of a drilling rig on-site, requiring 3 crews of 7 working around the clock for approximately 20 days. This level of activity is likely to displace breeding mountain plovers some distance from the pad, making additional nesting habitat unsuitable for some distance around the drill rig, and may constitute harassment. Traffic and risks of vehicle collision will greatly increase during drilling. Any of these factors that incrementally reduce the habitat quality leading to abandonment of a previously used breeding area may constitute take in the form of harm.

Operation: Though traffic will greatly decrease after construction, operating wells will still require periodic maintenance and visits to remove produced condensate, thereby maintaining low levels of impact associated with traffic and human activity. Elevated structures on the well pad, especially condensate tanks, will provide new nest and perch sites for corvids (i.e., common raven and black-billed magpie) and birds of prey, including ferruginous hawks, golden eagles, great horned owls, and loggerhead shrikes. Presence of these known or suspected predators of mountain plovers and their eggs and chicks will increase the likelihood of mortality. Work-over of producing wells during the breeding season will occasionally produce levels of traffic, noise, and human activities that could lead to direct take of mountain plovers or displacement from the vicinity of the well pad. Recreational use of the new road system will cause increased disturbance and risk of vehicle collisions.

Permanent structures that provide perch or nest sites for avian predators or den sites for terrestrial predators (e.g., buildings, tanks, and power poles) will indirectly increase the incidence of predation on mountain plovers. Any of these factors that incrementally reduce the habitat quality leading to abandonment of a previously used breeding area would constitute take in the form of harm.

Abandonment and Reclamation: Reclamation of drill pads, roads, and pipelines will involve a small increase in traffic, noise, and human activity from operation-level activities, possibly leading to take as well as disturbance and displacement of nesting plovers in the area. Reclamation activities initiated during the breeding season, unless meeting BLM's survey requirements, may crush eggs or chicks or lead to nest failure by displacing attendant adults. Placement of a marker to identify plugged wells may provide a permanent hunting perch for avian predators, increasing mortality risk to mountain plovers or displacing breeding birds from suitable habitat. Reclamation with plant species that produce a long-lasting stand of tall, dense vegetation will preclude nesting by mountain plovers as long as that vegetation persists.

Inter-related and Inter-dependent Effects: The highly interspersed checkerboard ownership on the analysis area creates the same challenges for protection of mountain plovers as for black-footed ferrets. Much of the discussion of inter-related and inter-dependent actions and their impacts on black-footed ferrets applies here. Development actions on non-Federal lands occurring as a result of a BLM action would have the same effects on nesting plovers or historically used breeding areas as such development will have on Federal surface, described above. To the extent that these actions are inter-related or inter-dependent to a Federal action, any effects to mountain plovers on non-Federal surface must be considered prior to permit issuance or other authorization by BLM.

Finally, activities occurring on Federal surface near boundaries with non-Federal surface may displace plovers nesting on adjacent non-Federal surface. Activities on non-Federal surface, including construction activities during the breeding season may cause direct take of eggs or newly-hatched chicks by displacing adults; construction, by enhancing predator habitat, may indirectly cause take, and construction, operation, or reclamation may cause abandonment of previously occupied breeding areas, constituting take in the form of harm.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or non-Federal actions that are reasonably certain to occur in the action area considered in this biological and conference opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The cumulative effects of the proposed project are difficult to quantify for several reasons. Because half of the analysis area is State and private surface, as many as 1,500 well pads, 750 miles of new or improved

roads, and 750 miles of pipelines are reasonably certain to occur on State or private surface. However, many of the gas development activities on non-Federal land will require grants of ROW from the BLM for access and are therefore inter-related and inter-dependent to the ROW grants. The ROW grants and inter-related and inter-dependent actions constitute Federal actions subject to review under section 7 of the Act and therefore are not considered under cumulative effects.

Some amount of non-Federal land will be developed through county and State roads with no future Federal action, and therefore constitute cumulative effects. No analysis has yet quantified the extent of possible development on non-Federal lands where access is now available, and any such analysis would be labor-intensive and somewhat speculative. However, every other section is under Federal ownership and access to non-Federal surface will usually require a Federal action (i.e., ROW permit), therefore the amount of development requiring no future Federal oversight (i.e., cumulative effects) will be small relative to the overall project.

Finally, the data presented are not adequate to determine the distribution and abundance of the black-footed ferret or mountain plover on State and private lands in the analysis area. Likewise, there are no accurate estimates of suitable habitat for these species on State and private lands, though such habitat may occur in the analysis area. For this reason, the extent of cumulative effects to the species is difficult to quantify. However, because of the relatively small number of actions involving no future Federal nexus, the Service believes that cumulative effects to the black-footed ferret or mountain plover are likely to be small. Therefore, for purposes of this analysis, we assume that cumulative effects comprise a small number of gas development activities on State and private lands.

Conclusion

LISTED SPECIES

After reviewing the current status of the black-footed ferret, the environmental baseline for the action area, the effects of the proposed gas development, and the cumulative effects from oil and gas wells and associated facilities, roads, railroads, livestock grazing, and towns, it is the Service's biological opinion that the Continental Divide/Wamsutter II Natural Gas project, as proposed, is not likely to jeopardize the continued existence of the black-footed ferret. No critical habitat has been designated for this species, therefore, none will be affected.

No wild, non-reintroduced populations of black-footed ferrets are currently known, therefore the recovery of the black-footed ferret is now assumed to be entirely dependent on the captive breeding program and the resulting re-introduced populations. Because of the extremely low number of founders in the captive breeding program, any addition of new genetic material would appreciably increase the recovery potential of the species. Therefore, loss of a previously undocumented ferret population to provide this new genetic material would significantly decrease the chances for this species' survival and recovery. Given the short life-span of ferrets and their dependence on continued recruitment to maintain a population, it is likely that any black-footed ferret found would be part of a remnant population. Moreover, while loss of such a population would jeopardize the species, loss of one individual would not.

A large portion of the analysis area now contains prairie dog towns, some of which may provide suitable ferret habitat. Black-footed ferrets and their remains have been observed on or near the analysis area in the past. However, there have been no recorded observations in the last 11 years, suggesting that if the species still occurs in the area, it occurs in low abundance or in particularly remote or un-surveyed portions of the analysis area.

Proposed exploration and development of natural gas resources is not likely to have major, long-term effects to the existing ferret habitat on the analysis area. Only a small acreage of prairie dog towns is likely to be disturbed, and prairie dogs quickly recolonize disturbed areas. Furthermore, black-footed ferrets at Meeteetse coexisted with an operating oil field, suggesting that effects to ferrets from gas field operation are unlikely to jeopardize a population. However, if black-footed ferrets are on the analysis area, the likelihood that project development will directly cause the lethal take of a black-footed ferret cannot be discounted. The proposed project may harm or harass black-footed ferrets if occupied ferret habitat is disturbed.

The cumulative effects of the project involve a relatively small but unquantified number of actions occurring on non-Federal land where legal access currently exists. The effects of these actions will be similar to those on Federal land, but there will be far fewer of them.

Based on the status of the species, environmental baseline on the analysis area, effects of the action, and cumulative effects, we conclude that the project, as described, may lead to some disturbance of individuals and a chance for lethal take. However, these effects will not rise to the level of jeopardizing the continued existence of the species.

PROPOSED SPECIES

After reviewing the current status of the mountain plover, the environmental baseline for the action area, the effects of the proposed project and the cumulative effects, it is the Service's conference opinion that the Continental Divide/Wamsutter II Natural Gas project, as proposed, is not likely to jeopardize the continued existence of the proposed mountain plover. No critical habitat has been proposed for this species, therefore none will be affected.

Range-wide, population numbers of mountain plovers are believed to have declined to fewer than 10,000 birds. An estimated 1,500 mountain plovers, or about 15% of the total population, breed in Wyoming. This estimate in Wyoming is based predominantly on counts from known breeding concentrations outside of the analysis area.

None of Wyoming's documented mountain plover concentration areas are contained in the analysis area, though individual birds have been observed during the breeding season. This suggests that the project is unlikely to affect a large portion of the population in Wyoming or range-wide.

The effects of gas development on breeding mountain plovers are not known. Some lethal take of the species may occur on the analysis area as breeding birds are displaced from eggs or newly-hatched chicks, through vehicle collision, or as a result of increased predation. While the proposed project will affect areas of suitable habitat and may affect occupied habitat, nowhere will development be intensive. Therefore, effects to the plover are not expected to be severe.

Cumulative effects to the mountain plover involve the small number of projects without Federal oversight on the analysis area. Furthermore, individual actions will have only a local effect, adversely affecting a few breeding plovers at most. Coupled with the apparent low abundance of the species, the cumulative effects of this small number of these projects on the mountain plover will likely affect a fraction of a percent of the entire population.

Based on the known distribution of the species, the probable effects of gas development on breeding plovers from the proposed action, and the small amount of cumulative effects on the analysis area, the project is likely to cause some lethal take, but will not be extensive enough to jeopardize the species.

INCIDENTAL TAKE STATEMENT

Introduction

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Bureau of Land Management so that they become binding conditions of any grant or permit issued to the operators, as appropriate, for the exemption in section 7(o)(2) to apply. The Bureau has a continuing duty to regulate the activity covered by this incidental take statement. If the Bureau (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to resulting permit or grant documents, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Bureau must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR 402.14(i)(3)].

Amount or extent of take anticipated

LISTED SPECIES

Direct mortality of ferrets could result from vehicle collision due to increased traffic and new roads, or destruction of occupied dens during any ground-disturbing activities in occupied habitat. Indirect mortality could result from introduction of canine distemper or enhancement of predator habitat (e.g., creation of new perch or nest sites). Therefore, direct lethal take during the life of the project is anticipated. No up-to-date information is available on the current status of the species or the extent of suitable habitat on the analysis area. Furthermore, actual site-specific details of development activities are not part of the project description. Given this lack of information, it is impossible to determine the extent to which development activities may cause direct lethal take, therefore the amount of direct lethal take cannot be quantified at this time. Rather, direct lethal take will be quantified on an individual project-specific basis once BLM has identified specific projects proposed for occupied black-footed ferret habitat.

Take in the form of harm due to degradation of occupied habitat or harassment due to human activities in occupied habitat may occur during the life-of-project. Take in the form of harm could result from any construction activity that reduces the abundance of prairie dogs in occupied habitat, even if reductions are only temporary. Take in the form of harassment could result from any human activities associated with construction, operation, or reclamation that disturb black-footed ferrets enough to displace them from their home range. Though the proposed project, as described, outlines measures to avoid ferret habitat (i.e., prairie dog towns), and requires surveys for ferrets where avoidance is not possible, the possibility of harm or harassment to black-footed ferrets remains if occupied habitat must be disturbed. Therefore, incidental take in the form of harm or harassment due to disturbance of occupied, suitable black-footed ferret habitat is anticipated.

Given the limited information available on suitable ferret habitat on the analysis area, a worst case scenario of habitat impacts (i.e., take in the form of 'harm and harass') can be developed. Available information on the distribution of black-footed ferret habitat on the analysis area is limited to present/absence by 1-square mile units (BLM 1999a, Map 3.11; also Appendix 1). This source shows that 324 sections may contain prairie dog towns. Lacking site-specific information on project impacts, a reasonable worst-case estimate of harm and harassment must assume that the entire surface of these 324 sections contains suitable ferret habitat and each of the 324 sections will be developed. Given that average project-related disturbance is estimated at 3.6 acres per well location (including necessary roads and pipelines but not ancillary facilities; draft EIS, Table 2.1) and the proposed level of development is 4 well locations per section, a maximum of 4,666 acres of potentially suitable black-footed ferret habitat could be disturbed. Because impacts will be dispersed (no more than 2.25% of any section disturbed), destruction or degradation an individual ferret's habitat would rarely be intensive enough to cause death, though injury would still be likely.

More accurate and up-to-date mapping of suitable ferret habitat will likely find less of the 4,666 acres actually provide suitable habitat, thereby reducing the probability of realizing this worst-case scenario. Measures in the BA and described in the proposed project, designed to avoid of suitable habitat, will likely further decrease the amount of suitable habitat disturbed. Finally, disturbance of suitable habitat that is found, through adequate ferret survey effort, to support no population of black-footed ferrets will not harm or harass black-footed ferrets. Based on these facts, while it is likely that some incidental take in the form of harm or harassment will occur, an accurate estimate of the amount of habitat degradation causing harm or human activities causing harassment cannot be quantified at this time. Rather, take in the form of harm or harassment will be

quantified on an individual project-specific basis once BLM has identified specific projects proposed for occupied black-footed ferret habitat.

A goal of this incidental take statement is to develop methods to determine the extent of suitable ferret habitat on the analysis area, so that it will be possible to quantify the potential impacts of site-specific actions within identified areas of suitable habitat, determine the necessity of black-footed ferret surveys, quantify take, and identify necessary protective measures.

PROPOSED SPECIES

Direct lethal take of adult mountain plovers or chicks may occur through vehicle collision. The likelihood of vehicle collision is highest during development but remains elevated through operation and abandonment. Destruction of nests could result from vehicle traffic on an infrequent basis. Displacement of adults from nests or broods long enough to cause take of eggs or chicks through exposure to the elements or predators may occur, especially if people will be nearby on foot for many hours.

Indirect lethal take, especially of eggs and chicks, may occur through increases in predator abundance due to project features providing increased perch and nest sites around plover nesting areas and new food sources in the form of carrion caused by vehicle collisions.

The Service anticipates such lethal take of the mountain plover will be difficult to detect due to the cryptic nature of eggs and chicks, the dispersed nature of breeding birds, the lack of current distribution data on the analysis area, the rapidity with which carcasses are scavenged, and difficulty of measuring increased mortality of adults, eggs or chicks due to indirect project effects on predator abundance.

Information on the distribution and abundance of the mountain plover on the analysis area is currently inadequate to determine the number of birds that may be affected by the proposed project. Furthermore, actual site-specific details of development activities are not provided in the project description. Given this lack of information, it is impossible to determine the extent to which development activities may cause lethal take, therefore the amount of direct lethal take cannot be quantified at this time. Rather, direct lethal take will be quantified on an individual project-specific basis once BLM has identified specific projects proposed for occupied mountain plover habitat.

Displacement of breeding birds from known nesting areas to less suitable nesting habitat may occur due to habitat alteration (harm) and human activity (harassment) associated with project development and ongoing operation. Where development increases predator abundance or hunting efficiency, nesting plovers may be displaced to nest in less suitable habitat. Abandonment of previously occupied breeding aggregation areas due to habitat degradation may result. Loss of such a formerly used site would constitute take in the form of harm or harassment and must be anticipated.

Data on the current distribution on and use of the analysis area by breeding mountain plovers are sparse and inadequate to reasonably estimate potential project impacts. Furthermore, actual site-specific details of development activities are not provided in the project description. Given this lack of information, it is impossible to determine the extent to which development activities may cause take through harm or harassment, therefore the amount of such take cannot be quantified at this time. Rather, harm and harassment will be quantified on an individual project-specific basis once BLM has identified specific projects proposed for occupied mountain plover habitat.

Apparently suitable but unoccupied mountain plover habitat is distributed across the analysis area and therefore disturbance to suitable habitat is a poor indicator of the likelihood of direct lethal take and provides no measure of incidental take in the form of harm or harassment. Until surveys document the distribution of the species on the analysis area, suitable habitat may potentially harbor breeding mountain plovers. To begin to gather the data necessary to quantify the possible project impacts to breeding mountain plovers, this incidental take statement is designed to identify areas of suitable habitat and to promote surveys to determine use by nesting plovers. Once surveys have been conducted and if no mountain plovers are found, areas of apparently suitable but unoccupied habitat will receive no protection. Conversely, if the birds are found to use the area, potential impacts and the amount of incidental take can then be quantified.

Effect of the take

In the accompanying biological and conference opinions, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species.

Reasonable and prudent measuresLISTED SPECIES

The distribution and abundance of the black-footed ferret on the analysis area remain unknown. Due to their extreme rarity and nocturnal, fossorial habits, observations will be difficult under the best of circumstances. The amount of suitable habitat is unknown at this time but suitable habitat likely occurs on the analysis area. Therefore, these reasonable and prudent measures and their implementing terms and conditions are designed to: 1) identify and quantify suitable habitat, 2) minimize disturbance of suitable habitat, 3) identify occupied habitat prior to disturbance, 4) minimize disturbance to occupied habitat when unavoidable, and 5) avoid or minimize take of any ferrets found to be present.

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the black-footed ferret. Due to the programmatic nature of this consultation, one or more of the following reasonable and prudent measures may be modified or waived by the Service based upon review of information on site-specific project activities.

- BLM employees, Operators' employees, and contractors shall be educated on the natural history of the black-footed ferret, identification of ferrets and their sign, activities that may affect ferret behavior and ways to minimize these effects.
- Because domestic dogs may serve as a vector for canine distemper, BLM, Operators, and sub-contractors shall establish policies that no dogs will be on sites during working hours.
- Observations of black-footed ferrets, their sign, or carcasses shall be promptly reported to the BLM, Rawlins or Rock Springs Field Offices and the Service, Wyoming Field Office.
- To minimize possible direct take of black-footed ferrets, suitable ferret habitat (as defined in this biological opinion) must be mapped and activities in suitable habitat must be preceded by ferret surveys following the methods in Ferret Guidelines.
- Should surveys or any incidental observations find black-footed ferrets or their sign within a prairie dog town or complex for which project-related activities are proposed, the BLM shall initiate section 7 consultation with the Service on the proposed action. If any black-footed ferrets or their sign are found within a prairie dog town or complex previously determined to be unsuitable for, or free of, ferrets, all previously authorized project-related activities on-going in such towns or complexes shall be suspended immediately and section 7 consultation initiated with the Service.

PROPOSED SPECIES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the mountain plover. The prohibitions against taking the species found in section 9 of the Act do not apply unless the species is listed. However, the Service advises the BLM to consider implementing the following reasonable and prudent measures even prior to listing. If this conference opinion is adopted as a biological opinion following a listing or designation, these measures, with their implementing terms and conditions, will be nondiscretionary. Due to the programmatic nature of this consultation, any of the following reasonable and prudent measures may be modified or waived by the Service upon review of details of future site-specific project activities, should the mountain plover be listed.

Protection of nesting and brood-rearing plovers should minimize the likelihood of take without unnecessarily inhibiting development activities on unoccupied sites. While there are several records of mountain plovers on the analysis area during the breeding season, there have been no systematic surveys to quantify their

distribution and abundance there. Available natural history information shows that breeding plovers show high nest site fidelity between years. They also tend to nest in loose associations, or nesting aggregation areas, of densities as high as 80 nests per square mile over a few square miles, surrounded by apparently suitable but unoccupied habitat (Graul 1975). Therefore, a reasonable means of extending protection should involve identification of occupied habitat, including nesting aggregations where some protective restrictions on project activities shall apply while relaxing or waiving protective measures in areas where plovers have not been observed once surveys have been completed. Breeding aggregations are defined here as two or more observations, within 2 miles of each other during one breeding season, of one of the following: territorial adults, nests, adult distraction displays, or broods. This is consistent with spatial scale of breeding aggregations in Utah (Ellis 1998) and Colorado (Knopf 1996).

The following reasonable and prudent measures are designed first to avoid direct impacts to nesting mountain plovers through activity-specific searches for nests, and second, to avoid or minimizing impacts to known nesting aggregations by 1) identifying aggregations on the analysis area prior to development, 2) avoiding or minimizing direct or indirect take of adults, eggs, or chicks on these areas, and 3) avoiding the abandonment of nesting aggregation areas.

- Operators and BLM employees shall be shown how to identify the mountain plover and provided information about its habitat requirements, natural history, status, threats, and possible impacts of gas development activities. Incidental observation of mountain plovers shall be solicited from all field personnel.
- No ground-disturbing activities shall occur in suitable breeding habitat during the breeding season prior to compliance with the Service's Mountain Plover Survey Guidelines (Appendix 4), or other Service-approved survey method.
- Use (or lack thereof) of areas of suitable habitat by breeding mountain plovers must be determined prior to site disturbance, regardless of the timing of disturbance. The Wildlife Protection Plan provides a useful mechanism to carry out broad-scale surveys for mountain plover breeding activity, focusing on areas of high development potential and historical sightings of plovers during the breeding season. Site-specific surveys as outlined in the Plover Guidelines are not necessary for this purpose. Broader scale, less intensive surveys should be done. While these will not locate every nest or brood, they will identify aggregations of plover breeding activity.
- Once occupied habitat (including breeding aggregations) is located, the BLM shall initiate section 7 consultation with the Service on any project-related activities proposed for such habitat, with the exception of geophysical exploration activities (i.e., use of shot-hole, surface shot, or vibro-seismic techniques) conducted outside the breeding season for plovers (April 10 to July 10).

Terms and conditions

LISTED SPECIES

In order to be exempt from the prohibitions of section 9 of the Act, the BLM must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary. However, due to the programmatic nature of this consultation, any of the following terms and conditions may be modified or waived by the Service as a result of future details of site-specific project activities.

Black-footed Ferret

1) Operators and BLM shall be provided by the Service with fact sheets and these materials shall be posted in common areas and circulated in a memorandum among all employees and service providers. Fact sheets shall illustrate the black-footed ferret and its sign; describe morphology, tracks, scat, skull, habitat characteristics, behavior, current status, and causes of decline; and the relationship between gas field development and impacts to black-footed ferret, especially regarding canine distemper.

2) BLM and Operators shall conduct educational outreach to employees regarding the nature, hosts, and symptoms of canine distemper, and its effects on black-footed ferrets, focusing attention on why employees

should not have pets on work sites during *or* after hours. BLM shall require Operators to develop policies to prohibit dogs from operation sites during work hours.

3) All suspected observations of black-footed ferrets, their sign, or carcasses on the analysis area, however obtained, shall be promptly reported to:

Wildlife Biologists, BLM,
Mary Read, (307) 328-4255
Larry Apple, (307) 328-4204
Rawlins Field Office
P.O. Box 2407
1300 North 3rd Street
Rawlins, WY 82301
Field Supervisor or Designee, U.S.F.W.S.
(307) 772-2374
Wyoming Field Office,
4000 Airport Parkway,
Cheyenne, WY 82001

Wildlife Biologist, BLM,
Jim Dunder, (307) 352-0315
Rock Springs Field Office
280 Highway 191
Rock Springs, WY 82901

Observations shall include a description including what was seen, time, date, exact location, and observer's name, address, and telephone number. Carcasses or other suspected ferret remains shall be collected by BLM or Service employees and deposited with the Service, Wyoming Field Office.

4) All prairie dog towns entirely or partially on the analysis area shall be mapped. Mapping may occur from aircraft. Surveys from aircraft must be followed by ground surveys when prairie dog town boundaries cannot be accurately determined from the aerial survey. It is essential that mapping occur over the entire analysis area, regardless of surface ownership. Then, the sizes of mapped towns and complexes shall be calculated to determine which towns/complexes are at least 1,000 acres in size. Finally, density of active burrows shall be estimated only on any towns or complexes found to exceed 1,000 acres to determine the extent of suitable black-footed ferret habitat. All steps shall follow the methodology of Biggins et al. (1993; Appendix 5) with the exception that the definition of suitable habitat and a complex shall be consistent with this biological opinion.

By October 15, 2002, all prairie dog towns shall be mapped on the analysis area. Density estimation, where necessary (i.e., on those towns or complexes exceeding 1,000 acres), shall focus on the areas of highest potential gas development (approximately 1/3 of the analysis area) consisting of those townships entirely or partially east of the town of Red Desert. Additional thirds shall be covered by mapping and density estimation no later than the end of years 2001, and 2002 until completion. Methods and results of mapping and burrow density estimation completed in 2000 shall be provided with a report to the Service's Wyoming Field Office no later than October 15, 2000, with additional results provided annually on October 15, 2001, and 2002, until complete.

Until mapping is completed over the entire analysis area, any prairie dog towns proposed for disturbance prior to inclusion in the mapping effort must be cleared consistent with the 1989 Black-footed Ferret Survey Guidelines. Burrow density of 8 burrows per acre and 200 acre areal extent of towns and complexes (as defined in the 1989 Ferret Guidelines) shall require surveys prior to disturbance, following the 1989 guidelines. Because these guidelines were developed to address section 7 compliance on a case-by-case basis they are more appropriate where towns have not yet been included in the area-wide mapping effort.

5) No ground-disturbing activities may occur within 50 m of prairie dog towns prior to detailed mapping of the spatial extent of the town(s) to be affected in accordance with Term and Condition 5 of this biological opinion.

Existing prairie dog maps of the Wamsutter NEPA analysis area (Hayden-Wing 1995) may serve this purpose on an interim basis for calendar year 2000. Activities outside the Wamsutter analysis area but within the CD/WII analysis area in 2000 will require town-by-town mapping as project locations are identified.

Because of the age of the data used and questions about the methodology used for the Hayden-Wing (1995) report, an adequate random sample of towns in the Wamsutter NEPA document shall be re-mapped and densities estimated using the Biggins et al. (1993) methods during the 2000 field season. If the existing maps are shown to provide area and active burrow density estimates within 10% of the re-survey, the Wamsutter maps may continue to serve for describing suitable ferret habitat, otherwise all towns in the Wamsutter NEPA analysis area shall be re-mapped and densities re-estimated using the new methodology.

6) Once the town or towns to be affected has been mapped and suitable habitat identified, no ground-disturbing activities shall occur within suitable habitat until all identified suitable habitat within the affected town and that portion of any town or towns constituting suitable habitat within $\frac{1}{2}$ -mile of the project boundary has received a black-footed ferret survey, consistent with the 1989 Ferret Guidelines or other methods upon Service review and approval. Consistent with this document, no surveys will be required on towns or complexes that fail to meet the definition of suitable habitat provided in the Status of the Species section as long as they have been included in the area-wide mapping effort. Otherwise, the 1989 Ferret Survey Guidelines shall apply.

Should surveys find no ferrets or sign, ground-disturbing activities may occur within 1 year of the date of survey completion within the town surveyed. However, surveys should be completed as close to the date of project initiation as possible to avoid the possibility of a ferret moving into the area after surveys have cleared the area. Alternatively, all suitable habitat within the entire complex in which the town is located may be surveyed and if no ferrets or sign are found the complex will be designated "ferret-free" and no further section 7 review for the black-footed ferret will be required for activities occurring within any prairie dog town within the complex. Future observations of ferrets or their sign shall, however, require re-initiation of section 7 consultation.

Results of all surveys shall be reported to the Service's Wyoming Field Office, including maps of areas surveyed, surveyor qualifications, method of survey, length of survey, date, weather, snow cover, survey results, and copies of field data sheets.

7) Should surveys or any incidental observations find black-footed ferrets or their sign within a prairie dog town or complex for which project-related activities are proposed, the BLM shall initiate section 7 consultation with the Service on the proposed action. If any black-footed ferrets or their sign are found within a prairie dog town or complex previously determined to be unsuitable for, or free of, ferrets, all previously authorized project-related activities on-going in such towns or complexes shall be suspended immediately and section 7 consultation initiated with the Service.

8) BLM, Wyoming Game and Fish Department, Operators, Service and any other involved parties shall meet annually to discuss progress, effectiveness, and any necessary modifications to these terms and conditions. Meetings shall be scheduled to coincide with annual meetings for the Wildlife Protection Plan, as described in Appendix D of the EIS.

PROPOSED SPECIES

The prohibitions against taking the species found in section 9 of the Act do not apply unless the species is listed. However, the Service advises the BLM to consider implementing the following terms and conditions even prior to listing. If this conference opinion is adopted as a biological opinion following a listing or designation, in order to be exempt from the prohibitions of section 9 of the Act, the BLM must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. At that time, these terms and conditions will become nondiscretionary.

Mountain Plover

Due to the programmatic nature of this consultation, any of the following terms and conditions may be modified or waived by the Service as a result of future details of site-specific project activities, should the mountain plover be listed.

9) Operators and BLM shall be provided by the Service with educational material illustrating and describing the mountain plover, its habitat needs, life history, threats, and gas development activities that may lead to incidental take of eggs, chicks, or adults with requirements that these material be posted in common areas and circulated in a memorandum among all employees and service providers.

10) All suspected observations of mountain plover adults, eggs, chicks, or carcasses on the analysis area, however obtained, shall be promptly reported to:

Wildlife Biologists, BLM,
Mary Read, (307) 328-4255
Larry Apple, (307) 328-4204
Rawlins Field Office
P.O. Box 2407
1300 North 3rd Street
Rawlins, WY 82301
Field Supervisor or Designee, U.S.F.W.S.
(307) 772-2374
Wyoming Field Office,
4000 Airport Parkway,
Cheyenne, WY 82001

Wildlife Biologist, BLM,
Jim Dunder, (307) 352-0315
Rock Springs Field Office
280 Highway 191
Rock Springs, WY 82901

Observations shall include a description including what was seen, time, date, exact location, and observer's name, address, and telephone number. Carcasses or other suspected plover remains shall be collected by BLM or Service employees and deposited with the Service's Wyoming Field Office.

11) Between April 10 and July 10, travel in vehicles over 1,000 pounds shall be restricted to existing roads, trails, and well pads, unless first cleared by surveys consistent with the Plover Guidelines, or another Service-reviewed and approved survey method. Results of all plover surveys shall be reported to the Service's Wyoming Field Office.

12) Geophysical exploration involving shot-hole, surface shot, or vibro-seismic techniques may destroy plover nests and displace incubating or brooding plovers. To minimize destruction or failure of nests, no geophysical exploration shall occur from April 10 to July 10 prior to clearance consistent with the Plover Guidelines or other Service-approved method. If mountain plovers are found, exploration work will be re-scheduled until after the nest becomes inactive. Results of all plover surveys shall be reported to the Service's Wyoming Field Office.

13) Broad-scale mountain plover surveys shall be conducted using techniques reviewed and approved by the Service to identify occupied mountain plover habitat, including breeding aggregations. Breeding aggregations are defined here as two or more observations, within 2 miles of each other during one breeding season, of any of the following: territorial adults, nests, adult distraction displays, or broods. Techniques shall be designed to document the occurrence of breeding plovers within 2 miles of historical and current locations, and if possible estimate abundance (see example, Appendix 6). The survey method would likely consist of a BBS-style survey, conducted early (April 15 - May 7) and late (June 7 - July 10) during the breeding season, involving 50-75, 5-minute stops per survey route. This would amount to 4-5 person-days per route. Should proposed development or BLM's workload increase, some additional assistance from operators may be necessary, not to

exceed an estimated 3 person-days per township proposed for development. The details of this survey technique, or any alternate technique that may be proposed by BLM, shall be reviewed and approved by the Service prior to implementation.

Survey effort shall focus first on locations of past sightings within areas likely to be developed at greater than 1 well per section in 2000 and 2001. Survey effort shall then continue, maintaining a 1-year lead on development proposed to exceed one well per section. BLM shall require operators to submit detailed development plans for the coming year to them by March 15 annually so survey effort can be planned. Results shall be provided to the Service's Wyoming Field Office including surveyor qualifications, date, exact location and survey effort for all surveys, locations of all plovers observed, nests or young observed, behaviors observed, and copies of field data sheets.

14) Once occupied habitat (including breeding concentrations) is located, the BLM shall initiate section 7 consultation with the Service on any project-related activities proposed for such habitat.

15) BLM, Wyoming Game and Fish Department, operators, Service and any other involved parties shall meet annually to discuss progress, effectiveness, and any necessary modifications to these terms and conditions. Meetings shall be scheduled to coincide with annual meetings for the Wildlife Protection Plan, as described in Appendix D of the EIS.

Conclusion

The Service anticipates the proposed project will incidentally take an unquantifiable number of black-footed ferrets, in the form of direct mortality, and harm or harassment through disturbance of an unquantifiable amount of occupied suitable ferret habitat. The Service also anticipates the proposed project will incidentally take an unquantifiable number of: mountain plover nests through destruction or abandonment; mountain plover adults and chicks through direct lethal take; and an unquantifiable amount of breeding habitat in used breeding aggregation areas through harm or harassment. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, any incidental take is detected, such incidental take represents new information requiring re-initiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Coordination of Incidental Take Statements with Other Laws, Regulations, and Policies

If the mountain plover is listed pursuant to the Act, the Service will not refer the incidental take of mountain plovers for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-712), if such take is in compliance with the terms and conditions (including numbers 9-14) specified herein.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1) Assist in developing partnerships and funding research to develop more efficient and effective black-footed ferret survey techniques. Item 332 from the Black-footed ferret recovery plan states, "Develop and improve survey techniques" and includes sub-item 3326, "Test use of dogs using scent combinations from captive ferrets and field trials" with the objective of developing a more reliable survey technique for locating new wild ferret populations. An improved survey technique will aid recovery of the black-footed ferret by increasing the probability of locating any remaining wild populations, in compliance with section 7(a)(1) of the Act. It will also provide for more efficient, reliable, and cost-effective clearance of prairie dog towns for identifying suitable re-introduction sites and the block-clearance and discontinuance of the need for project-level ferret surveys of prairie dog towns pursuant to section 7(a)(2) of the Act. See attached study proposal for possible funding (Appendix 7).

2) Conduct block-clearance of all black-footed ferret habitat (consistent with the definition of suitable habitat in this document) within or contiguous with the analysis area. Future actions, including maintenance, work-over, and reclamation, within towns previously cleared of ferrets may require additional survey work unless the entire complex containing the towns has been cleared (block clearance). Such an effort would greatly facilitate future planning and work on the analysis area. Some terms and conditions in this biological opinion require mapping and estimating burrow densities of prairie dog complexes and provide the necessary first step in a possible block-clearance effort. This is an opportunity that could be easily extended into block-clearance and should be given serious consideration. The Service is very interested in working with BLM, operators, and other interested parties to pursue this work.

3) Develop reclamation methods suitable to meet all requirements for soil stability and weed control while providing suitable breeding habitat for mountain plovers. Currently, the techniques for reclamation of disturbed sites produce tall and dense stands of species such as thick-spike wheatgrass (*Elymus dasystachyum*), unsuitable for nesting mountain plovers. BLM and operators should work together to develop cost-effective cultivation techniques for low-growing and vigorous species native to the analysis area that will quickly reproduce suitable habitat for breeding mountain plovers where it previously occurred.

4) Conduct research to better understand the effects of oil and gas development on breeding mountain plovers. The focus of research should be to measure recruitment to the fall population, philopatry, and site fidelity between developed and undeveloped mountain plover breeding concentration areas on or near the analysis area. Terms and conditions outlined in this conference opinion will provide a useful starting point by identifying possible study sites currently under development, proposed for development, and not proposed for development. This effort would require close monitoring of a large sample of breeding adults, and possibly color-marking or radio-marking adults and juveniles.

5) Working with industry representatives, develop a new design for condensate storage that is not suitable as a nest or perch site for birds of prey and corvids. The placement of large numbers of condensate tanks in areas where perches and nest sites are currently limited may greatly alter the composition and abundance of the avian predator community, reducing habitat suitability for many species in addition to the mountain plover and black-footed ferret. Re-designing condensate storage tanks will require understanding the nature of the existing design which lends itself to nest construction and useful perch sites, and understanding of the structural, functional, and human safety features necessary for a feasible new design. Thus, this effort should involve entities with expertise in engineering and gas field operations as well as entities with expertise in bird behavior. Because such expertise is currently available and organized in the parties cooperating on the Wildlife Protection Plan, the Service recommends that such an effort be developed through this ongoing effort.

7) Roadside spotlight surveys have proved useful for surveying mountain plover broods in Utah. BLM or operators should conduct spot-light surveys after dark within $\frac{1}{2}$ -mile of known concentration areas from June 15 to July 15 to develop an index of brood size and abundance.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations, and receipt of any report developed as a result of their implementation.

RE-INITIATION NOTICE

This concludes formal consultation and conferencing on the proposed Continental Divide/Wamsutter II Natural Gas Project, Sweetwater and Carbon Counties, Wyoming, and the biological assessment submitted to the Service on December 7, 1999. As provided in 50 CFR 402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) that agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation.

You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if the mountain plover is designated as threatened or endangered. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary.

After listing of the mountain plover as endangered or threatened and/or designation of critical habitat for the mountain plover and any subsequent adoption of this conference opinion, the Federal agency shall request reinitiation of consultation if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this conference opinion; (3) that agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this conference opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

The incidental take statement provided in this conference opinion does not become effective until the species is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of the mountain plover has occurred. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of the mountain plover may occur between the listing of the mountain plover and the adoption of the conference opinion through formal consultation, or the completion of a subsequent formal consultation.

Thank you for your assistance in the conservation of endangered, and proposed species. If you have any questions or comments on this biological opinion, please contact David Felley at the letterhead address or by phone at (307) 772-2374, extension 23.

Appendices (7)

cc: State Director, BLM, Cheyenne, WY
Acting GARD, No. Ecosystems, FWS, Denver, CO
M. Brennan, Holland & Hart, Jackson, WY

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- WEST, Inc. 1999. Wildlife monitoring studies, Seawest Windpower Project, Carbon County, Wyoming, 1995-1998, Draft report. WEST, Inc., 2003 Central Ave, Cheyenne, Wyoming 82001.

APPENDIX 1

White-tailed Prairie Dog Distribution (presence/absence by section) on the Continental Divide/Wamsutter II Analysis Area

from

Draft Environmental Impact Statement:
Continental Divide/Wamsutter II Natural Gas Project,
Sweetwater and Carbon Counties, Wyoming.
Prepared by TRC Mariah Associates, Inc.
for the Bureau of Land Management, Rawlins and Rock Springs Field Offices,
Rawlins and Rock Springs, Wyoming.

APPENDIX 2

Mountain Plover Observations in the Vicinity of the Continental Divide/Wamsutter II Analysis Area

Date	Location	Source
06/27/91	T19N, R94W, S. 10, N1/2	Robert Dorn
06/29/99	T16N, R93W, S. 20, SW1/4, SW1/4	BLM, Rawlins
06/23/83	T22N, R95W, S. 2, NW1/4, NE 1/4	WOS
05/02/87	T23N, R91W, S. 10, SW1/4, NE1/4	WOS
05/26/86	T24N, R92W, S. 34	WOS
06/25/91	T23N, R93W, S. 12, SW1/4, NE1/4	WOS
08/16/96	T18N, R94W, S. 4, NW1/4	WOS
06/24/81	T19N, R95W, S. 35	WOS
06/23/81	T18N, R95W, S. 20	WOS
04/17/92	T22N, R99W, S. 12, SE1/4, NE1/4	WOS

APPENDIX 3

**BLM Instruction Memorandum No. WY-99-24:
The Extent of Federal Authority over Actions Occurring on Private Lands
- Plants & Wildlife**

APPENDIX 4

**Mountain Plover Survey Guidelines
U.S. Fish and Wildlife Service 1999**

APPENDIX 5

A Technique for Evaluating Black-footed Ferret Habitat

APPENDIX 6

Mountain Plover Study Proposal Landscape-level Surveys in the Great Divide Basin U.S. Fish and Wildlife Service 2000

APPENDIX 7

Study Proposal for the Testing of Ferret-sniffing Dogs as an Improved Black-footed Ferret Survey Technique

APPENDIX H:**COMMENTS RECEIVED ON THE CONTINENTAL DIVIDE/WAMSUTTER II
FINAL ENVIRONMENTAL IMPACT STATEMENT AND BLM RESPONSE**

**Comments Received on the Continental Divide/Wamsutter II
Final Environmental Impact Statement**

The final environmental impact statement (FEIS) was issued December 10, 1999 for a 30 day comment period. Over 700 copies of the FEIS were distributed to the public for review and comment. In addition, media releases were sent to newspapers in Wyoming announcing the availability of the FEIS for public review. Only four comment letters were received. Three of the letters expressed some concerns about adding additional mitigation and amending/revising the Great Divide Resource Management Plan (RMP) for the Rawlins Field Office (RFO) area; however, all four comment letters were generally in support of the analysis and/or proposed development. Comment letters and Bureau of Land Management (BLM) responses are presented on the following pages.

Letter 1 - Gene R. George, Agent for Yates Petroleum Corp.; Response

General Response; Entire Letter - Thank you for taking the time to review the FEIS and for providing your comments. The BLM considers all comments during preparation of an environmental impact statement (EIS).

1. The BLM agrees applicant committed mitigation will provide adequate protection for most resources. However, the EIS revealed that some resources may still have significant impacts. BLM believes additional mitigation identified in the EIS analysis for these resources may be necessary to further reduce or minimize the anticipated impacts. Through Application for Permit to Drill (APD)- and right-of-way (ROW)-level environmental analysis these additional requirements will be appropriately applied. In addition, the formal consultation/conference with the U.S. Fish and Wildlife Service (USFWS) revealed additional terms and conditions which must also be implemented to ensure certain wildlife species are not adversely affected. Many of these terms and conditions outlined in the USFWS Biological Opinion were not applicant committed mitigation as outlined in the draft or final EIS documents; and therefore, they need to be identified and carried forward as part of the Record of Decision (ROD).

2. The BLM agrees there may be some minor gains in the reasonably foreseeable development (RFD) by restoring acreage from reclaimed plugged and abandoned wells. However, we do not believe there have been a sufficient number of plugged wells since the Great Divide RMP was approved November 8, 1990 to significantly increase the RFD acreage for future oil and gas development. In addition, wells drilled on private lands are part of the RFD projection analyzed in the RMP. Therefore, all wells whether on private or federal lands are counted against the RFD. Based on projected future oil and gas development, the BLM still anticipates a RMP review and possible modification.

The BLM is also mindful of the fact coal bed methane wells can require less disturbed area. As you are also aware, the depth of the wells may vary from one region to another and subsequently the surface disturbance can be similar to a shallow oil and gas well to half that acreage for shallower depths. In any event, we are interested in total surface disturbance and not just well numbers. The BLM will take this into account when analyzing future projects.

3. The BLM agrees oil and gas development could increase vegetative habitat for plover. Because there is already considerable habitat in the project area and since studies seem to show plover concentrate in the same nesting areas each year, a banking or credit system for increasing habitat does not seem applicable for this species. The USFWS biological opinion (see ROD Appendix G) points out that it is not the amount of habitat available but the potential harm due to increased, long-term disturbance (i.e., human presence) near established nesting sites and therefore, the loss of nesting habitat in an established breeding concentration area.

Letter 2 - Kirk Steinle, BP Amoco; Response

General Response; Entire Letter - Thank you for taking the time to review the FEIS and for providing your comments. The BLM considers all comments during preparation of an EIS.

1. BLM does not believe additional mitigation identified in the EIS analysis for water resource will be necessary to further reduce or minimize the anticipated impacts. However, through APD and ROW level environmental analysis, additional requirements may be identified and if necessary will be appropriately applied.
 2. No "adaptive management program" specific to surface water resources is planned at this time. The BLM believes existing surface water protection measures coupled with transportation and reclamation planning as presented in the EIS will adequately protect this resource. Should a specific management program be developed in the future, all land uses will be evaluated to determine where additional protection measures are needed.
 3. The BLM concurs with your recommendation.
 4. Based on the Continental Divide/Wamsutter II (CD/WII) EIS air quality analysis, the BLM sees no need for an oxide of nitrogen (NO_x) Tracking Agreement. Furthermore, the Wyoming Department of Environmental Quality-Air Quality Division (DEQ-AQD) has not requested that we have one.
 5. BLM agrees applicant avoidance of stabilized sand dunes is the best measure of protection. However, the analysis revealed this will not be possible in all cases and therefore there could be significant impacts to soils through activation of stabilized dunes. Even though Appendix A (Reclamation Plan) addresses some additional reclamation practices which will be used, BLM believes additional mitigation identified in the EIS analysis for this resource may be necessary to further reduce or minimize the anticipated impacts. Through APD and ROW level environmental analysis these additional requirements will be appropriately applied.
 6. The BLM agrees the applicant committed Wildlife Protection Plan (ROD Appendix D) is a significant step in determining additional mitigation needs, and the BLM intends to use this program to identify future needs. However, the EIS revealed that some indirect wildlife impacts (i.e., human disturbance of big game) may still result in significant impacts even without monitoring. BLM believes additional mitigation identified in the EIS analysis for big game may be necessary to further reduce or minimize the anticipated impacts. Through APD and ROW level environmental analysis these additional requirements will be appropriately applied. In addition, the formal consultation/conference with the USFWS revealed additional terms and conditions which must also be implemented to ensure certain wildlife species are not adversely affected. Many of these terms and conditions outlined in the USFWS Biological Opinion were not applicant-committed mitigation as outlined in the draft or final EIS documents; and therefore, they need to be identified and carried forward as part of the ROD.
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7. Since Visual Resource Management (VRM) Class II areas are those which could incur significant impacts, the BLM agrees that additional mitigation measures will most likely be applied to VRM Class II areas. Through APD and ROW level environmental analysis these additional requirements will be appropriately applied. Please understand that VRM Class III and IV areas also need a degree of protection. If for some reason applicant-committed measures are not adequate to reduce impacts, additional mitigation measures may be used to reach the required standard. However, we anticipate this to be the exception and not the rule.

8. The CD/WII EIS certainly provides some background information to help identify issues and potential impacts related to oil and gas resources. However, it does not follow the framework for completing a review of an existing RMP. The process is begun by issuing a public notice through the Federal Register. The BLM must also re_evaluate the RFD for oil and gas exploration and development activities in the Great Divide Resource Area (GDRA) RMP/EIS. In addition to the RFD for oil and gas exploration and development activities, the BLM must also review the reasonably foreseeable activities or actions involving other land use and resource management programs, like recreation, livestock grazing, wildlife habitat, etc. There may be direct or interrelated cause_and_effect relationships (other than just those related to oil and gas actions) among all of these activities or actions that could require amending RMP decisions. The BLM is anticipating the immediate review of the GDRA RMP/EIS. Pending receipt of adequate funding, it is hopeful the review will begin within the next year.

9. Since completion of the CD/WII draft and final EIS documents, it has come to the BLM's attention that there could be proposals for two to three coal bed methane projects and one major deep gas project within the next year. Projected numbers could easily exceed 500 wells. It is not the BLM's intent to deny proponents of the CD/WII project their projected 3,000 well proposal without justification. As indicated in the draft and final EIS, no more than 1,655 wells could be allowed in the Rawlins Field Office area (formerly the GDRA) under the RFD assumptions for the GDRA RMP. This is assuming no other wells outside the project area are drilled. Since oil and gas development projects will likely continue on both private and public lands outside the project area before a RMP review can be completed, it seems only prudent that an additional but reasonable limitation be put on well numbers within the CD/WII project so that a RMP review can be completed without prohibiting this project and other proposed developments. Once a RMP review is completed, the CD/WII ROD could be re-evaluated against the revised RMP and an amended ROD could be issued to allow the additional wells analyzed in the CD/WII EIS.

Letter 3 - Claire M. Moseley, Public Lands Advocacy; Response

General Response; Entire Letter - Thank you for taking the time to review the FEIS and for providing your comments. The BLM considers all comments during preparation of an EIS.

1. See response comments 8 and 9 to the Kirk Steinle, BP Amoco Letter 2. As you may be aware the GDRA RMP was a planning document projected to last 20 years through the year 2005. Reasonable foreseeable development for oil and gas was based on 1985-86 data; and at the time the projections for surface use seemed quite reasonable. It wasn't until recently these projections appeared to be inadequate. The BLM is now actively pursuing review of the RMP and hopes to conclude the review before 2005. In order to maintain some reasonable amount of development and remain within the planning decisions. It is imperative that some limitations be put on current development proposals until the RMP review is completed.
 2. See response comment 4 of the Kirk Steinle, BP Amoco Letter 2.
 3. See response comment 6 of the Kirk Steinle, BP Amoco Letter 2.
 4. The BLM initiated reviews with the USFWS on the draft Biological Assessment for the CD/WII project in October 1998. However, as time elapsed, new concerns were brought forward for black-footed ferret (listed species) and for mountain plover (proposed listed species) which eventually lead to formal consultation/conference. Based on USFWS reviews of other EIS projects recently approved in Wyoming, this formal consultation/conference was not anticipated.
 5. See response comment 7 of the Kirk Steinle, BP Amoco Letter 2.
 6. See response comment 5 of the Kirk Steinle, BP Amoco Letter 2.
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Letter 4 - Cynthia G. Cody, U.S. Environmental Protection Agency; Response

General Response; Entire Letter - Thank you for taking the time to review the FEIS and for providing your comments. The BLM considers all comments during preparation of an EIS.
